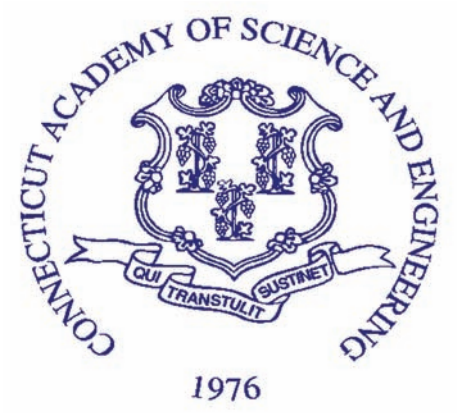
A Needs-Based Analysis of the University of Connecticut Health Center Facilities Plan

March 2008

A Report By

The Connecticut Academy of Science and Engineering



For

The Connecticut General Assembly

- Appropriations Committee
- Commerce Committee
- Finance, Revenue and Bonding Committee
- Higher Education and Employment Advancement Committee
- Public Health Committee

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Date Inquiry Established: August 17, 2008

Date Response Released: March 18, 2008

This study was initiated at the request of the Connecticut General Assembly on August 17, 2007. The project was conducted by an Academy Study Committee with the support of Project Consultant, Tripp Umbach. The content of this report lies within the province of the Academy's Economic Development, Health Care and Medical Technologies, Human Resources and Public Health Technical Boards. The report has been reviewed by Academy Member Paul D. Cleary, PhD, Dean, Yale University School of Public Health and Jordan J. Cohen, M.D., President Emeritus, Association of American Medical Colleges, and Professor of Medicine and Public Health, George Washington University. Martha Sherman, the Academy's Managing Editor, edited the report. The report is hereby released with the approval of the Academy Council.

Richard H. Strauss
Executive Director

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EXECUTIVE SUMMARY

INTRODUCTION

In January 2007 the University of Connecticut Health Center (UCHC) Board of Directors and the University of Connecticut (UConn) Board of Trustees voted to authorize construction of a new 352-bed hospital to replace and expand the UCHC John Dempsey Hospital (JDH).

The replacement hospital proposal was included in the Connecticut General Assembly's Raised Bill No. 1316 and was referred for consideration to the Committee on Higher Education and Employment Advancement, which held a public hearing on March 8, 2007, that featured numerous speakers both in support of and in opposition to project. Following the hearing, legislation was adopted naming the Connecticut Academy of Science and Engineering (CASE) to conduct a Needs-Based Analysis of the UCHC Facilities Plan on behalf of the General Assembly. The study was conducted in consultation with the Office of Health Care Access. The legislation required that CASE issue a final report of its analysis to the Committees on Appropriations; Commerce; Finance, Revenue and Bonding; Higher Education and Employment Advancement; and Public Health no later than June 30, 2008.

The opinions voiced at the March 8, 2007, public hearing were a continuation of a debate that began more than 50 years ago about the best location for the UConn medical school and the optimal relationship between a medical school located in the Hartford area and the area's community hospitals. The need to develop a suitable clinical base for the medical school was recognized early on as an issue that would require significant ongoing attention, and continues to be a key factor in UCHC's desire to build an expanded clinical care facility as a replacement for JDH. At the same time, hospitals in the Greater Hartford region remain keenly concerned that an expanded JDH replacement would adversely affect their financial health and consequently their ability to deliver quality health care. All parties agree on the paramount need for UCHC to achieve excellence in the schools of medicine and dental medicine.

CASE convened a Study Committee that was responsible for overseeing the study and the work effort of the project study consultant, Tripp Umbach. Details of the scope of work mandated by the legislation requiring the study and additional areas of analysis identified by the Study Committee are included in the Introduction section of this report.

The Study Committee developed the study's suggestions and findings based on meetings, briefings and discussions, and analyses conducted throughout the study process. The Study Committee actively sought and received input from UCHC, the regional hospitals potentially affected by UConn's replacement hospital proposal, individuals with knowledge of the history of UCHC's founding and its relationship to the regional hospitals, as well as from UConn's 4th year medical school students.

The analyses included in Tripp Umbach's report (Appendix A) provide an important foundation and context for the development of the Study Committee's suggestions and findings. The following represents an overview of Tripp Umbach's analyses.

TRIPP UMBACH: RESEARCH FINDINGS (APPENDIX A)

American Association of Medical Colleges (AAMC) Benchmarking Data
US Medical School Hospital Benchmarking Analysis
See Page 30 (Appendix A – Tripp Umbach Report)

Among schools that own their hospitals, there is a strong relationship between bed capacity and research productivity as measured by external funding received from the National Institutes of Health (NIH). None of the hospitals of the top ten medical schools has less than 450 beds and only two of the second ten have under 400 beds. The top three schools (University of Washington (UW), University of California, San Francisco (UCSF), and UCLA) list two primary hospitals but many of the others also control non-owned public (county, Veterans Administration) hospitals on or near their main campus. Among the schools with hospitals separate from their university, the bed capacities are much more variable. As a group these institutions are substantially less academically productive than those of the owned hospital group. None is in the NIH top 20 and only nine are in the top 50. The schools without primary teaching hospitals place a low priority on research and, as expected, group at the bottom.

UConn does surprisingly well in national comparisons with other public medical schools despite a very small hospital and no adjacent county or VA hospital. UConn's $62 million in federal funds and NIH rank of 63rd competes with those who enjoy hospitals twice as large. The two institutions with smaller hospitals rank 96th and 118th respectively. Connecticut might want to consider the history of Washington, another state with a single public medical school. The UW University Hospital opened 175 beds in 1959 and gradually expanded to 360 by the early 1960s, followed by additional expansions in 1984 and 1995 bringing the hospital to its current capacity of 450. Washington is currently the top public medical school for federal funding and for the last 25 years has rarely, if ever, been out of the top five. UConn is not unusual in starting with a small university hospital. They are unusual in staying at the same size for so long.

There is great diversity in organizational and ownership structures for academic health centers throughout the United States. As noted in the Tripp Umbach report, there are numerous financial and research ranking relationships between the ownership of hospitals and medical schools. However, with regard to ownership/management of the medical school, hospital and practice plan there is no industry standard—"if you have seen one, you have seen one." The key to success is often relationships, governance structures and clearly articulated financial relationships.

- Similarities: Integrated health delivery systems must work together to teach students and graduate trainees, conduct clinical research and provide clinical care to the populations they serve.
- Differences: The structure of the relationship between the medical school, teaching hospital and practice plans varies from place to place. There is no standard.
- Key findings from previous Tripp Umbach research show that regardless of ownership or governance structure, it is critical to develop strong relationships and structures that work for each individual academic health center.

- Leaders of the top American schools of medicine and hospitals favor different structures; it is often the structure under which they work or are most familiar.
- Regardless of the governance and leadership structure, an integrated health delivery system must meet its inherent responsibilities to teach, advance medical knowledge, and provide exemplary clinical care.
- Research suggests that success depends largely upon the character and ability of its faculty and its leaders rather than on the structure under which they are governed.
- "There isn't an ideal governance model. It's locally defined and impacted by whoever fills the roles." —Philip A. Pizzo, MD, Stanford

The issues of governance and organization are critical for medical schools when forming strategic partnerships and affiliations with clinical partners. The key components to consider when changing the current structures of an existing academic health center parallel many of the same discussions that need to occur when beginning a new medical school, specifically governance, faculty, and finances.

If UCHC is no longer in direct control of its teaching hospital, negotiations about the structure of the relationship will be extremely important. The type and level of interaction between the medical school, the hospital and the practice plan will be essential to building a stronger academic health center. The difficulty of forming a strong bond with a clinical affiliate is not to be underestimated. Relationships and trust are key components to building success. Guarantees will need to be made to preserve the integrity of academic medical education.

Key Findings from Stakeholder Interviews
See Page 42 (Appendix A – Tripp Umbach Report)

One component of the study was to complete interviews and tours with key stakeholders in the region regarding the future of UCHC and JDH. Names of potential interviewees were provided to Tripp Umbach by the regional hospitals and UCHC. An interview guide was developed collaboratively between Tripp Umbach and members of the Study Committee. The interview guide was distributed in advance of each meeting and discussions were conducted by Tripp Umbach.

Interviews were scheduled and completed via telephone or in person with 54 individuals. Leadership at each hospital was contacted including (in alphabetical order): Bristol Hospital, Charlotte Hungerford Hospital, The Hospital of Central Connecticut, Hartford Hospital, Middlesex Hospital, St. Francis Hospital and UCHC. Participants in the interview process included: clinical faculty from the regional hospitals and UCHC, and key leadership at the regional hospitals and at UCHC. The interviews covered three main topic areas: 1) Proposed expansion of John Dempsey Hospital; 2) Relationships with UCHC and/or Regional Hospitals; and 3) Academic Medical Education in the State of Connecticut. Following are the key findings from the interviews:

KEY FINDING 1: MARKET SHARE, BED NEEDS AND FINANCIAL VIABILITY

From a Regional Hospital Perspective

In nearly all interviews, the issue of market share, financial issues and payor mix were raised by the respondents. The Greater Hartford and State of Connecticut markets are small with limited population size and slow population growth. Patients, especially those with health insurance, are a commodity. It was the contention of many regional hospital leaders and clinical faculty that any expansion of JDH would negatively impact their bottom line and potentially cause their facility to close because of market share shift.

It was stated by many respondents that Connecticut is over-bedded and does not need to add additional beds to meet the health needs of its residents. Many felt that the expansion of JDH by 120 beds would just further overcrowd the market, cause a significant market share shift and not bring any real efficiencies to healthcare in the area. With profit margins so tight and the financial stability of many regional hospitals at risk, growing JDH would exacerbate the problems and issues. Respondents stated that there were better and more efficient ways for UConn to meet their needs for medical education without spending $500 million on an expansion project.

It was clearly stated by many regional hospital leaders that the patient population served by the regional hospitals value the regional hospitals presence in the local community setting and that financial constraints imposed upon them by JDH's expansion would cause significant community outcry.

From UCHC's Perspective

According to leadership at UConn, it is mission critical to address the clinical component of medical education at UConn. JDH is not a state-of-the-art facility and does not have enough beds to support medical education or research, thereby hindering the fulfillment of the mission of the UConn School of Medicine to the state of Connecticut and its residents.

UConn respondents stated that their limited hospital size, in conjunction with their encumbered bed numbers (NICU, psychiatric beds and prison floor), with only 108 medical surgical beds to see patients and fulfill their academic mission, have not allowed them to advance clinically and increase their financial independence. There are three legs on the stool in academic medicine: education, research and clinical care. Without working on all three aspects of academic medicine, the school will not rise up in the ranks and will become increasingly unable to recruit top-level students, faculty and research.

KEY FINDING 2: RELATIONSHIPS BETWEEN REGIONAL HOSPITALS AND UCHC

There is strong evidence of collaboration and partnership between the regional hospitals and the University of Connecticut Health Center. In nearly all interviews with the regional hospitals and the University of Connecticut, examples of joint facility and academic appointments, cooperation on medical education of students and residents, and joint recruiting of top-notch clinical faculty were shared. Regional hospitals and UConn collaborate frequently to meet the educational needs of the school of medicine.

However, relationship issues do exist between the regional hospitals and the UConn School of Medicine. There has been a long history of competition, political wrangling and infighting both between the regional hospitals and the regional hospitals and UConn. Since UCHC was built out in Farmington, its role as the safety-net hospital has been questioned along with its level of state financial support. Corporate (organizational) culture issues abound between the regional hospitals and UCHC, which cause misunderstandings and mistrust between the parties involved.

KEY FINDING 3: IN SUPPORT OF ACADEMIC MEDICAL EDUCATION

While there is much disagreement on how UConn should move forward with their plans to grow and advance medical education, all parties agreed that it is critical to support medical education in the state. When specifically asked if the state should continue to have and support medical education, the response was unequivocally "yes," but it was unclear from the interviews how much state support should be given and what level of financial support should come from the state.

Discussions about how the school could function in an even more distributed model were held with respondents from the regional hospitals. Leaders at the larger hospitals felt that they could continue to grow their financial and administrative support of UCHC's medical education mission at all three levels—education, research and clinical care.

From the perspective of UCHC, there is clear acknowledgment of the support it receives from its clinical partners in educating medical students and residents throughout the region. There is no doubt that they are not "going it alone" in their educational endeavor and the collaboration between regional partners has been invaluable.

With regard to partnerships and different medical school models to enhance UCHC, there were varied opinions (both positive and negative) about pursuing a more distributed model than currently exists. Many interviewed at UCHC, especially those involved in research, felt that the strength of having research space, clinical space and education co-located was invaluable to providing synergy for scientific and clinical discovery, thereby favoring an integrated approach to academic medicine.

KEY FINDING 4: MEDICAID REIMBURSEMENT, CERTIFICATE OF NEED (CON) AND STATE HEALTH PLAN

Issues were raised by the regional hospitals about the disparities in Medicaid reimbursement between their facilities and UCHC. In addition, it was stated by many that the absence of a statewide health plan and the current structure of the CON process in the absence of a state plan creates an even more politically charged healthcare environment for all entities. It was clear that there is a great deal of misunderstanding about how Medicaid reimbursement rates are set as well as why the supposed disparities exist.

KEY FINDING 5: BETTER DEFINING UCHC'S ROLE

Throughout the interviews, it became apparent that there is not a solid understanding of UConn's role as the state medical school within the community and among the regional

hospitals. Tripp Umbach believes that this is a great opportunity for the regional hospitals and UCHC to further build relationships and partnerships. Strategically for UCHC, it is critical that the broader healthcare community and residents of the state understand the value that academic medicine can bring to the region. UCHC needs to work to communicate and continue to assert its role as the state's academic health center.

Based on all the interviews, it is clear that the discussion of building a replacement hospital and its impact on market share and patient volumes needs to be addressed but should not be the primary focus of any decision regarding academic medicine in the state of Connecticut. It is Tripp Umbach's opinion that the discussion must be elevated to a broader and more visionary level regarding how to best support and enhance medical education in the state, so that yet another opportunity will not be lost.

Key Findings from University of Connecticut Medical Student Survey
See Page 46 (Appendix A – Tripp Umbach Report)

An online survey was developed in cooperation with the UConn School of Medicine, Study Committee and Tripp Umbach. A total of 43 responses from 4th year medical school students were analyzed for the purposes of this report. A full summary of results is presented in Appendix A of the Tripp Umbach report.

The goal of the survey was to gather information about the educational and learning experience at John Dempsey Hospital, Hartford Hospital, St. Francis Hospital, the Hospital of Central Connecticut and Connecticut Children's Medical Center. Question by question there are variances in overall response, but it is clear that all regional hospitals are providing quality educational experiences. JDH performs consistently at parity or above the other regional players.

Overall results show that JDH rates very highly in comparison to the other regional hospital with 50% of students reporting that the overall learning environment "Exceeds Expectations" or is "Superior." The Connecticut Children's Medical Center received the top score of 65%. The other regional hospitals performed quite well in this category as well.

Bed Analysis Study
See Page 47 (Appendix A – Tripp Umbach Report)

Tripp Umbach completed a comprehensive bed study for the State of Connecticut, Greater Hartford Area and JDH Primary Service Area. Tripp Umbach sought to examine current staffed beds[1] as compared to licensed beds[2] in the above three geographies and project potential growth in the market out to 2030 by 5-year intervals. To accomplish this task, Tripp Umbach utilized a market standard CON methodology based upon establishing historical, current and projected data in the following categories: population and demographic growth rates; inpatient utilization trends per 1,000 population; average length of stay; patient days; and target occupancy rate of 80%.

[1]Staffed Beds: Beds that are licensed and physically available for which staff is on hand to attend to the patient who occupies the bed. Staffed beds include those that are occupied and those that are vacant.

[2]Licensed Beds: The maximum number of beds for which a hospital holds a license to operate. Many hospitals do not operate all of the beds for which they are licensed.

Projecting future bed requirements required Tripp Umbach to develop numerous assumptions and scenarios to quantify how many beds will be required to effectively serve the state, region and JDH PSA. Based upon previous studies completed for other CON states, Tripp Umbach believes that the most likely scenario for bed requirements is based upon actual 2005 US reported inpatient utilization rates remaining flat to 2030 for four age demographic groups. This scenario looks at utilization rates broken out by: 0-17 years of age, 18-44 years of age, 45-64 years of age and 65 and older. Given the conservative 2005 US average utilization rates, this scenario reflects the significant shift in the demographic makeup of the population in the respective age groups, most notably the dramatic growth in the population aged 65 and older. Tripp Umbach would like to emphasize that these projections are based upon current healthcare trends and considering the volatility of the healthcare industry as a whole, should be continually evaluated and monitored based upon industry shifts and trends.

Of equal or possibly greater significance is the tremendous growth in the 65+ population and the implications for the healthcare system in Connecticut. As shown, this segment of the population has the highest utilization of inpatient healthcare services and providers must prepare for the demands this group places on physicians, clinical staff, and technology.

A summary of the key findings of the bed analysis is as follows:

- It appears that additional staffed beds are required throughout the state at this time. However, additional licensed beds may not be necessary in the state until between 2025 and 2030.
- In the JDH PSA, additional staffed beds should not be necessary until between 2020 and 2025 at the earliest. Moreover, based upon projections, additional licensed beds are not needed through 2030.
- By 2015, additional staffed beds should be brought online at the hospitals in the Greater Hartford Area to accommodate projected need. Newly licensed beds may be necessary in the area between 2020 and 2025 in order to meet patient demands.

University of Connecticut Health Center Physical Plant Review (Burt Hill)
See Page 76 (Appendix A – Tripp Umbach Report)

To complete the physical plant review, Tripp Umbach retained Burt Hill, an award-winning national firm specializing in integrated design solutions for academic health centers, universities, hospitals and research facilities. Burt Hill conducted a three-day onsite review of UCHC in November 2007, to determine the state of the physical facility and review the options of their master facility plans.

Since the early 2000s, the UCHC has commissioned several department-specific studies including the NICU and the Surgical Suite; in addition they have developed several master facility plans varying in size from a large addition to an entire hospital facility replacement. These studies show a thoughtful progression in vision and scope. The pros and cons of each plan/schematic can be debated on cost; services offered; constructability; or beds and services.

However, it is quickly obvious that the 40-year old physical plant is obsolete in terms of modern healthcare delivery and extremely constricted both by geography and geometry.

The hospital is located in three buildings: H (204,753 sq. ft.), F (91,466 sq. ft.), and C (335,518 sq. ft.), for a total gross area of 631,737 sq. ft.

Equipment in the corridors; excessive noise on the inpatient levels; lack of privacy for surgical and emergency patients; mechanical and electrical systems that are either maxed out or beyond their anticipated life; and a total absence of swing space all point to a much needed major capital construction project. The top three findings of the evaluation included

- The building is space tight, and additional space is needed to expand or modify any existing department. Without additional space, adjacent departments will need to sacrifice their already inadequate space for the benefit of another department.
- The current standard of care is for private inpatient rooms. The existing configuration cannot incorporate this concept without reducing the total bed count and increasing inefficiencies.
- Many of the existing pieces of mechanical equipment are at the end of their serviceable life and cannot be replaced or upgraded without a new location for the equipment.

The Master Plan options developed since 2000 represent a very "thoughtful progression in vision and scope." For purposes of this analysis, Burt Hill categorized four primary Master Plan options into the following generic categories as defined by the amount of new construction/ renovation:

- 60/40 Option (2003), Proposed Cost Range: $300,000,000
- 60/40 Option (2005), Proposed Cost Range: $300,000,000
- 80/20 Option (2005) (Option presented to the CT General Assembly), Proposed Cost Range: Approximately $495,000,000
- 100% New Option (2008) (Burt Hill Option), Proposed Cost Range: Approximately $507,000,000

Each option was evaluated based on how well it would meet the needs of UCHC and cost. Based on our comprehensive analysis, Burt Hill concludes that a 60/40 option would not meet the needs of UCHC. It is Burt Hill's belief that the only plans that would meet UCHC's ultimate goal of being an academic center of excellence would be either the 80/20 plan or the 100% plan.

Burt Hill has reviewed the cost assumptions for these plans and is in agreement with the planning level assumptions. Utilizing their own project cost projection and multipliers, Burt Hill determined that the proposed costs are within an acceptable range. However, any selected option must be adjusted for inflation once a project schedule is determined. The table below provides cost estimates for both the 80/20 and 100% option for JDH hospital only, the UConn School of Medicine (SOM) and the combined totals. The combined total for each option includes an estimated cost of approximately $88 million for the renovation of the vacated JDH for research and academic use.

	80/20 % Option			100% Option		
	JDH/SOM	JDH	SOM	JDH/SOM	JDH	SOM
New Construction	$ 417,415,441	$ 417,415,441		$ 473,758,146	$ 473,758,146	
Renovation	$ 36,353,711	$ 36,353,711		$ -	$ -	
Parking	$ 33,283,260	$ 33,283,260		$ 33,284,742	$ 33,284,742	
Affected Areas		$ 7,938,630				
Research	$ 87,657,516		$ 87,657,516	$ 87,657,516		$ 87,657,516
TOTAL	$ 574,709,928	$ 494,991,042	$ 87,657,516	$ 594,700,404	$ 507,042,888	$ 87,657,516

Notes:
1. Inflation is calculated to the mid-point of construction 2010
2. The 80 / 20 % Option includes a contingency of -- $ 66,124,401
3. The 100 % Option includes a contingency of -- $ 69,391,402

CLINICAL FACILITY

Overall, the hospital is limited in what it can modify or add by virtue of the strong geometry and absence of open spaces within the building. The lack of privacy within the facility should be corrected, but this cannot be accomplished within the existing building envelope without severely compromising the existing services offered or the maintenance of a safe patient and family environment.

Any additional square footage any place in the complex would require additional chiller and boiler capacity. Any renovated space in the complex with equipment older than 15 years must incorporate air side equipment and floor system replacement. Aged units should be replaced with modern equipment including steam or hydronic reheat and variable frequency drives. Floor systems should be variable volume reheat where applicable with hydronic reheat. Hydronic or steam heating is recommended since the current utility rates have electric heat costs at 2.4 times that of natural gas. 100% outside air air handling units should be converted to return air where applicable. If 100% outside air is required, heat recovery should be incorporated.

RESEARCH FACILITIES

In order to enhance the research space and research productivity at UCHC, the following is recommended:

- Provide more open plan research lab areas in building H (Patient Tower, with ER below, part of Surgery) and L (Research building (Long/Narrow))
- Undertake incremental renovations to buildings H and L
- Coordinate renovations in order to maintain adequate “swing space” during renovation process
- Convert “swing space” to expansion space at conclusion of renovation process
- Optimize research productivity/sq. ft. by adjusting allocations for underperforming groups

- Co-locate these groups with high performers in larger open lab areas, modulate space allocations as appropriate
- Focus on developing research activities in conjunction with targeted clinical "centers"
- Pair clinical areas with research activities that require close proximity to patient populations

ACADEMIC FACILITIES

With a maximum class size of 80 students per class in medical school, 40 per class in the dental school, and 125 students enrolled in PhD programs, the current facilities are excellent for this population. Facilities appear to be well utilized and some renovation has occurred in order to keep pace with changes in pedagogy/technology. However, it is noteworthy that expansion of the academic facility would be required if class sizes were to increase, and the facility will need to be modernized to keep pace with other medical schools around the country. Students continue to look for certain amenities and technologies as essentials to their lifestyle and education needs.

The academic facilities are among the best in the country because of their strong integration with research and clinical facilities. The library is well located and well equipped. The dental school and medical schools are well respected. Moreover, the medical and dental students are instructed side-by-side for the first two years. The curriculum has been lauded as one of the most innovative in the country. The direct proximity of the academic side of the house to the clinical and research programs offers UConn a competitive advantage when compared to other facilities around the country.

Economic Quantification Study: University of Connecticut Health Center
See Page 98 (Appendix A – Tripp Umbach Report)

Tripp Umbach conducted a comprehensive economic impact study of the current and projected economic impact of UCHC. To accomplish the task, Tripp Umbach calculated the direct and indirect economic impact for three distinct years (1995, 2000 and 2007).

Tripp Umbach developed customized models that calculate the economic, employment, and government revenue impacts associated with UCHC's operations. Data used in the analysis was provided through materials provided by UCHC and supplemented by Tripp Umbach's previous research with 125 research medical schools, 400 teaching hospitals and research enterprises throughout the United States. It is important to note that much of the data included in Tripp Umbach's models were based on actual historical data from similar-sized organizations and entities.

To calculate the economic impact of UCHC, Tripp Umbach used a methodology derived from the original set of research tools and techniques developed for the American Council on Education (ACE). The ACE-based methodology employs linear cash flow modeling to track the flow of institution-originated funds through a delineated spatial area. Traditional economic impact studies are based on direct spending and re-spending within the economy (multiplier effect) driven from the institution itself. Forward-linkage models measure the broader impacts that

occur or may occur in the economy as a result of the research and development activities of an institution—beyond the traditional direct and indirect impact. The data presented in this report represent annual, point-in-time economic snapshots of UCHC's impact on the state economy.

Overall Economic Impact: The overall state-level economic impact (direct and indirect) of UCHC's enterprise on the state of Connecticut in 1995 was $412.8 million (17% of AAMC CT Total), in 2000 it was $703.4 million (11% of AAMC CT Total) and in 2007 was $897.4 million (12% of CT Total).

Employment Impact of UCHC: The overall employment impact (direct and indirect) of UCHC's enterprise on the state of Connecticut in 1995 was 4,348, in 2000 it was 7,409 jobs and in 2007 was 9,452 jobs.

Government Revenue Impact of UCHC: In order to quantify the financial returns to state government, the models include a government revenue impact component, which calculates the total tax revenue generated by UCHC's operations. Overall government revenue impact (direct and indirect) of UCHC's enterprise on the state of Connecticut was $24.8 million in 1995, $42.2 million in 2000 and $53.8 million in 2007.

CONCLUSIONS

Based on the economic impact study, UCHC has a strong economic impact on the state's economy. With an overall economic impact of $897.4 million, an overall employment impact of 9,452 jobs and a government revenue impact of $53.8 million, there is no denying that UCHC is an economic engine for the state.

- Based on Tripp Umbach's modeling, JDH (separated from the academic and research functions of UCHC) has a current overall economic impact of $380.1 million.
- When modeling the proposed 350 bed replacement hospital, Tripp Umbach estimates that the new hospital would have an economic impact of $625 million, generate 3,250 jobs and create $38 million in state government revenue. It is important to note that this is a comparison of replacing the hospital only. This impact is of a new 350 bed hospital and would replace the current facility which generates $380.1 million in economic impact. The difference in impact is related to the increase in size and number of employees.
- Moreover, Tripp Umbach believes that enhanced clinical facilities would increase UCHC's overall ability to generate clinical revenues, increase research and enhance medical education thereby increasing its overall impact. UCHC's overall impact has not increased between 2000 and 2007.
- Tripp Umbach <u>does not</u> believe that the state of Connecticut needs to own/operate the new facility but <u>does</u> believe that clinical operations need to be enhanced or improved at UCHC.
- Based on the AAMC economic impact analysis, which includes UCHC and its teaching affiliates, Tripp Umbach believes that further collaboration with regional hospitals to achieve excellence would also increase the impact of academic medicine within the region and state.

CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING: SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUDING REMARKS

Findings

The Study Committee used the following key findings from the study process to develop options for consideration:

- UCHC has a strong economic impact on the state's economy.
- Current relationships between UCHC and its regional clinical care partners are neither sufficiently defined nor adequately enough developed to fully support UCHC's ability to achieve excellence in medical education.
- The existing facilities at JDH are outdated and too small to adequately support UCHC's goal of excellence in academic medicine. Additional investment is required for replacement and renovation for continued use for academic medicine purposes.
- Continuation of the status quo, i.e., no change in existing relationships with existing clinical care partners and no new or renovated UCHC facilities, jeopardizes the goal of achieving excellence in medical education explicitly.
- There is no need for additional licensed hospital beds in the Greater Hartford region at this time and for the foreseeable future.

Based on these findings and Tripp Umbach's analyses, the Study Committee identified two options which achieve the goal of strengthening UCHC and undergraduate and graduate academic medicine in the state. These options were then used to develop the committee's study recommendations.

OPTION 1

UCHC builds a new teaching hospital, either of similar size or larger than that proposed by UCHC, with the state owning and operating the facility.

Although this option provides UCHC with a larger, state-of-the art hospital that will be a significant upgrade in hospital facilities, it also adds additional hospital beds to the Greater Hartford region that cannot be justified based on the Bed Analysis and could result in possible negative financial impacts to the regional hospitals. This option solves UCHC's current hospital facility needs, but does not address its need for the development of strong regional clinical care partnerships to achieve excellence in its academic and research missions.

Also, Tripp Umbach's research findings highlight the need for a broader understanding within the Greater Hartford region regarding the value and support of academic medicine.

OPTION 2

This option involves UCHC formalizing, strengthening, and reinforcing relationships with current clinical care partners, and exploring relationships with other interested clinical care partners. This option offers several scenarios regarding construction of new clinical facilities on the UCHC campus that would not necessarily be owned and/or operated by the state.

This option would also provide UCHC with an opportunity to strengthen undergraduate and graduate medical education, grow research opportunities and continue to provide high-level clinical care.

UCHC leadership has long recognized the importance of its relationships with its clinical hospital partners to provide its students with academic medical clinical care education. However, it is noted that UCHC's past efforts to affiliate with a primary clinical care partner have been unsuccessful, most recently in the late 1990s.

The development of an effective framework in which UCHC can flourish as a leading and nationally recognized academic and research center is critical to its success. To accomplish this goal, it is necessary for UCHC and its regional partners to have a common vision of academic medicine that is integral to each partner's clinical care operations in order to achieve and sustain the collective mission of excellence in academic medicine.

The Study Committee maintains that regardless of the option selected, UCHC should have a strong voice in determining its destiny. The key to success in this endeavor is collaboration and mutual vision of academic medicine. Also, it is critical to note that UCHC, as the state-owned and operated academic health center, should be expected to require continued financial support from the State to maintain its education and research missions.

Recommendations

The Study Committee's recommendations are intended to be useful in shaping and motivating productive discussions among multiple parties with a goal of developing a productive regional environment for academic medicine and research. It is noted that UConn and its affiliated clinical care partners recently have been engaged in discussions in an attempt to address the issues that are the topic of this study.

The Study Committee believes that a continuation of the status quo, i.e., no change in existing relationships between UCHC and existing partners and no new or renovated UCHC facilities, jeopardizes the General Assembly's goal of UCHC achieving excellence in academic medicine and is not in the best interests of the state.

Consequently, the Study Committee recommends that efforts should immediately be focused on the implementation of Option 2 as the best opportunity to provide for the full range of UCHC's clinical needs, while simultaneously increasing opportunity and reducing or eliminating possible negative financial impact on the regional hospitals. Importantly, the Study Committee believes that its recommendations not only will provide UCHC the best opportunity to be fully recognized as an asset to the healthcare systems of the Greater Hartford region and the state, but also offer the potential for significant growth in economic impact as a result of its activities.

The strength of Option 2 is the focus on collaboration between UCHC and its regional partners. Option 2 involves formalizing, strengthening and reinforcing existing clinical hospital affiliate relationships. As stated in Tripp Umbach's analysis, key issues to resolve in the development of effective sustainable clinical affiliate relationships include, among others, governance and financial perspectives and faculty relationships.

Additionally, the Study Committee believes that there is a market for clinical healthcare facilities on the UCHC campus that should be owned and/or operated by a selected clinical care hospital partner. Having clinical facilities in close proximity to UCHC's principal academic and research base, along with that of the principal hospital of the selected hospital operating partner, will be an important asset to UCHC and its faculty in achieving their educational and research goals.

It is suggested that a two-step process be utilized to implement these recommendations, and that an independent monitor be named by the General Assembly to report on progress and outcomes of the process to ensure that the best interests of the state are taken into consideration:

1. Within a two-month time period, UCHC and regional hospital partners would develop a mutually agreed upon vision and set of guiding principles that will form the basis for establishing affiliation agreements between UCHC and its partners that include:

    a. UCHC's role in the state, region and community

    b. the value of undergraduate (dental and medical) and graduate medical education and the potential expansion of both programs

    c. potential cross-educational programs with allied health professional schools located at UConn's Storrs Campus and public health professionals, and development of new ways to team train all healthcare students

    d. potential of research and how research collaboration could elevate the entire economy of the region and state

    e. identification of what is necessary to strengthen academic medical education in the state

2. Within a six-month period, UCHC should conduct an RFP/RFQ process to select and articulate the detailed working relationships with clinical care hospital partners to support excellence in medical education in the state, while taking into consideration the needs of the stakeholders: UCHC, regional hospitals, and the residents of Connecticut.

    This process will also need to include decisions on the type of clinical facilities and clinical services that will be provided on the UCHC campus. It is noted that the existing licensed beds currently allocated to JDH and those beds that the selected clinical care hospital partner could reallocate to a new hospital under its existing license will likely be sufficient for new clinical facilities that would be located on the UCHC campus without seeking any increase in the total number of licensed beds of the two existing hospitals.

Concluding Remarks

The study process put in place by the General Assembly has encouraged renewed discussions between UCHC and several regional hospitals. It is in the best interest of UCHC and the regional hospitals to develop a system that will enable UCHC to flourish as a comprehensive academic health center of excellence for the benefit of the region and the state. The elimination of UCHC as a clinical care provider and competitor with the regional hospitals will remove a significant obstacle to the development of sustainable partner relationships. However, the Study Committee also strongly suggests that the General Assembly establish, as recommended, a workable, but aggressive, timetable to reach a successful conclusion to UCHC's selection of its clinical care hospital partners and the articulation of these relationships in affiliation agreements, as well as the selection of a clinical care partner to construct, own and operate new clinical facilities on the UCHC campus.

Further, it is suggested that in the development of the vision of academic medicine, consideration should be given to building upon UCHC's innovative 1st and 2nd year common curriculum for its dental and medical school students. There exists the opportunity to consider the development of a new approach to the clinical education of medical students that focuses on inter-professional education by placing medical students in teams with other healthcare professionals during their clinical rotations. Through the promotion of teamwork and inter-professional training, students will be able to be trained in a clinical environment that is characteristic of the current healthcare delivery system. If this is accomplished, UCHC and the Greater Hartford region would be at the cutting edge of training for the next generation of healthcare professionals.

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INTRODUCTION AND HISTORY

INTRODUCTION

In January 2007, the University of Connecticut Health Center's (UCHC) Board of Directors and the University of Connecticut's (UConn) Board of Trustees voted to authorize construction of a new 352-bed hospital to replace and expand the UCHC John Dempsey Hospital. Under the replacement plan, a new six-story, 546,000-square foot facility, located in front of existing main hospital entrance, would replace the existing 224-bed hospital[3]. The project was estimated to cost $495 million, with financing provided through the re-allocation of some UConn 2000 funds, through state-guaranteed bonds (with bonds to be repaid from UCHC clinical revenues), and through philanthropic gifts to the Health Center.

The replacement hospital proposal was included in the Connecticut General Assembly's Raised Bill No. 1316, "An Act Concerning the University of Connecticut Health Center's Clinical Facility Plan," the stated purpose of which was to "add a replacement hospital at the University of Connecticut Health Center as a named project for UConn 2000 and to provide that patient revenues be used to repay the bonds." The bill was referred to the Committee on Higher Education and Employment Advancement, which held a public hearing on March 8, 2007 that featured numerous speakers both in support of and in opposition to the bill.

In accordance with legislation adopted by the General Assembly, the Connecticut Academy of Science and Engineering (CASE) was named to conduct a Needs-Based Analysis of the UCHC Facilities Plan on behalf of the General Assembly. The legislation required that CASE issue a final report of its analysis to the Committees on Appropriations; Commerce; Finance, Revenue and Bonding; Higher Education and Employment Advancement; and Public Health no later than June 30, 2008.

The legislation also provided that the CASE study should be conducted in consultation with the Office of Health Care Access (OHCA). CASE and OCHA agreed that OCHA would

1. Be provided with an opportunity to review the final proposed scope of work for project consultants and provide comments to CASE for their consideration.
2. Provide CASE with OCHA data and reports relevant to the project scope of work.
3. Be invited to attend and participate in CASE Study Committee (the "Committee") meetings throughout the project.
4. Be provided an opportunity to review project draft report(s) and provide comments to CASE for their consideration with regard to factual matters only. OCHA will not be

[3]108 beds are available for Medical/Surgical use; with the balance of 116 beds encumbered for specific use/ programs as follows: 12 beds for Corrections; 40 beds for NICU (Newborn Intensive Care Unit); 10 beds for Healthy Newborn; 20 beds for Obstetrics, Labor and Delivery, with the Obstetrics Ward serving currently and traditionally for maternal fetal medicine and high risk pregnancy, which generates a number of babies for the NICU; and 34 beds for Psychiatric patients.

involved in the review of, or comment on, the findings, suggestions, or conclusions of the CASE Study Committee and its Project Consultant.

CASE was authorized to begin work on the study on August 17, 2007 under contract with the General Assembly's Office of Legislative Management. The legislation provided that the analysis would consider the following:

1. A comparison of the center's proposal for a replacement hospital with the alternative plan for a remodeled center.
2. The projected statewide need for hospital beds up to at least the year 2018 and any possible impact that any acute care hospital in the region may experience if the number of beds is increased at the university hospital.
3. The center's need for a modernized, academic medical facility to provide instruction and achieve excellence in the schools of medicine and dental medicine and the program in biomedical science; attract medical and biomedical professionals to such schools and program; and to support research and clinical trials.
4. Other factors that the Academy may deem appropriate.

Representatives from CASE subsequently met with the General Assembly's Study Oversight Committee, comprising the chairs and ranking members of the Appropriations Committee, Finance Revenue and Bonding Committee, and the Higher Education and Employment Advancement Committee, on October 11, 2007. As a result of this meeting, CASE expanded the project scope of work to include

1. Identification of various existing models of health professional schools and academic health centers of excellence.
2. Assessment of the capacity of regional hospitals to fulfill the undergraduate clinical education and postgraduate training components of UCHC's academic mission.
3. Identification of the size and facilities necessary for the John Dempsey Hospital to achieve excellence as an academic teaching hospital.
4. Analysis of the economic impact of UCHC.

CASE convened a Study Committee to oversee the needs-based analysis study in order to provide guidance to the General Assembly regarding the proposed UCHC Facilities Plan. The Study Committee was responsible for overseeing the consultant's work effort, and reviewed and accepted the consultant's work products and reports. Additionally, the Study Committee developed the study's suggestions and findings based on meetings, briefings and discussions, and analyses conducted throughout the study process.

CASE, in consultation with the Study Committee, selected Tripp Umbach as the Project Consultant to perform an analysis in accordance with the final project work scope, which included the following:

1. Project Background
2. (AAMC) Benchmarking Data
3. Key Findings from Stakeholder Interviews
4. State of Connecticut, Greater Hartford and John Dempsey Hospital PSA Bed Analysis Study (2005-2030)
5. University of Connecticut Physical Plant Review
6. Economic Impact Quantification Study

The Study Committee gathered and reviewed material relevant to the replacement hospital proposal, including

1. Facilities Plan and other related project information from UCHC.
2. Project-related data and information from the Office of Health Care Access.
3. Higher Education and Employment Advancement Committee March 8, 2007 Public Hearing transcript and written testimony.

The Study Committee also received briefings from executives of UCHC, executives from regional hospitals potentially affected by UConn's replacement hospital proposal, individuals with knowledge of the history of UCHC's founding and its relationship with the regional hospitals, as well as from UConn's 4th year medical school students. The Study Committee's meetings included

- briefing on the proposed UCHC Project from UCHC officials (September 20, 2007);
- briefing on the proposed UCHC Project from UCHC officials for Committee members unable to attend the September 20 briefing (October 4, 2007);
- briefing on the proposed UCHC project from Saint Francis Hospital officials (October 16, 2007);
- briefing on the proposed UCHC project from Hartford Hospital officials (October 25, 2007);
- briefing on the proposed UCHC project from Hospital of Central Connecticut officials (October 30, 2007);
- briefing on the proposed UCHC project from Middlesex Hospital officials;
- briefing on the history of the creation and development of UCHC by John Doyle (Appendix B);
- briefing on the development of UCHC by Marie O'Brien, President, Connecticut Development Authority;
- briefing from Regional Hospital consultant Nathan Kaufman, "Feasibility Analysis of the Proposed John Dempsey Hospital Expansion Project" (November 14, 2007);

- briefing on the proposed UCHC project from Bristol Hospital officials (November 29, 2007);
- briefing on the creation of UCHC from Hedvah Shuchman, based on her dissertation, "Professionalism and Political Influence: A Political History of the University of Connecticut Health Center" (Appendix C);
- briefing on the proposed UCHC project from Connecticut Children's Medical Center officials (December 14, 2007);
- meeting with a focus group of 4th year UConn medical students to discuss their educational experience including their clinical educational experience at UConn and regional hospitals (December 19, 2007;
- briefing on the proposed UCHC project from Charlotte-Hungerford Hospital officials (January 3, 2008).

Copies of material presented to the Committee are available on the Academy's website (http://www.ctcase.org/uchc/).

BRIEF OVERVIEW OF THE HISTORY OF UCHC

The opinions voiced at the March 8, 2006 hearing were a continuation of a debate that began more than 50 years ago about the best location for the medical school and about the optimal relationship between a medical school located in the Hartford area and the area hospitals. In particular, the issue of the need to develop a suitable clinical base for the medical school was recognized early on as an issue that would require significant ongoing attention.

In the 1940s, proponents of a second medical school in Connecticut (Yale was the first) argued that there were insufficient opportunities for Connecticut residents in the existing medical schools and that large areas of the state were underserved by physicians. Many of those promoting the new medical school felt that the public university should control the hospital associated with the medical-dental school, and urged that the school be located adjacent to McCook Hospital, a former municipal hospital in Hartford's North End, which predominately served the indigent. Meanwhile, the trustees of Hartford Hospital, as the sole Hartford area hospital with a graduate program, sought an exclusive affiliation with the new school, and argued that it be located on vacant land adjoining that hospital. Neither Mt. Sinai Hospital nor St. Francis Hospital took an official position during the early stages of this controversy.

In 1950, Governor Bowles' Fact-Finding Commission on Education formally introduced the idea that a dental school should be developed along with the medical school as part of the proposed state medical center.

The debate sharpened in 1957 when the public hospital commission reported on three possible sites for the medical-dental school, two near McCook Hospital and a third near Hartford Hospital, which at that point was actively promoting an exclusive affiliation between itself and the public university. This idea was strongly protested by St. Francis in correspondence with a variety of interested parties. A Citizens Committee was formed for the purpose of wresting control of planning from the university president, who favored the Hartford Hospital site.

At the same time, Hartford Hospital issued a report encouraging the university to build the medical-dental school on the site adjacent to their hospital.

In 1961, a Kennedy Administration program of grants to support the planning and building of medical schools injected new urgency into the discussion, with nine bills introduced in the

General Assembly to study the costs of such a school. In the closing hours of the 1961 legislative session, $2 million dollars was appropriated to start construction of a medical-dental school in Hartford County, with a special commission formed to select the site.

In the spring of 1962, legal problems definitively ruled out the McCook site. Other options considered by the commission included the VA hospital site in Newington, a state- owned chronic disease hospital, and several sites unrelated to medical use.

The commission, under pressure to act because of deadlines for federal aid and in a wholly unexpected move, recommended the school be located in Farmington. Despite an initial public outcry, support for the Farmington site grew over time. The commission further established that a new 400-bed university hospital also be built on the Farmington site, although only the first tower containing 224 beds was built. The University of Connecticut Health Center was officially established in the 1963 legislative session.

The need to develop a suitable clinical base for the medical school was recognized early on as an issue that would require significant ongoing attention. Dr. John W. Patterson, the UConn Health Center's first executive director and second dean of the School of Medicine, wrote in a 1972 case history of the founding of the UConn Medical School that "developing a clinical base" was one of the two biggest problems for the developing school. He further noted that this was a concern with which "the faculty must address itself on a continuing basis for some years to come."[4]

Since the development of the medical school and the construction of UCHC in Farmington, the Hartford area regional hospital community has raised questions regarding UCHC's

- clinical role as the safety net hospital
- continued financial support from the state
- overall role in the region.

It is noted that UCHC's geographic isolation from inner-city Hartford has remained an issue since it was built.

More recently, in 1996, discussions between UCHC and Hartford Hospital resulted in the development of a framework, a memorandum of understanding (MOU), to strengthen the clinical and academic programs of both institutions. This MOU sought to outline at the broadest level how these two organizations would work together to support the academic, clinical and research objectives of academic medicine of both institutions. This framework was seen as

[4] ***Case Histories of Ten New Medical Schools*, University of Connecticut School of Medicine, John W. Patterson, MD, PhD, DSc, Dean of the School of Medicine, University of Connecticut, Edited by Vernon W. Lippard and Elizabeth F. Purcell, The Josiah Macy, Jr. Foundation, 1972**

the first step in the formation of an alliance between the two institutions, with the final goal being to integrate financial, governance and management relationships. Reportedly, both institutions were involved in the further discussions for the development of the Alliance and significant progress was made on developing plans for the clinical, research and academic programs. Decisions were made about departmental structures, reporting relationships, clinical facilities and financial commitments. During this process, information regarding the proposed Alliance became public with other regional hospitals (specifically St. Francis Hospital) then becoming aware of the proposed plans. Subsequently, in 1998, efforts to develop the Alliance were terminated. The reasons behind the termination of discussions to create the Alliance center around the fact that the appropriate hospital players were not included in the discussion, thereby causing political pressure to cease discussions.

In 1999 due to an announcement by UCHC that it would reduce its workforce as a result of an estimated $21 million deficit, OHCA initiated an inquiry into the impact this action could have on "direct care services." This inquiry resulted in a January 2000 OHCA report, "Findings and Recommendations on the University of Connecticut Health Center, John Dempsey Hospital and the Hartford Health Care System." This report identified recommendations regarding several of the issues that are included in the scope of this study, but still remain unresolved as of the completion of this study. A copy of this report is available on the CASE website (http://www.ctcase.org/uchc/).

Also, around 2005 UCHC and several regional hospitals entered into discussions regarding possible alternatives for the development of more formally articulated alliances related to their working relationships to support academic medicine in the region. These discussions continued until late 2006, after which discussions were terminated due to UCHC proposing to build a replacement hospital at UCHC.

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUDING REMARKS

The Study Committee developed its findings based on a review of 1) analyses and interviews conducted by the CASE project consultant, Tripp Umbach; 2) briefings with UCHC, the regional hospitals and other interested parties; 3) historical and current operational issues; and 4) trends in the health care and academic health center industry. The study recommendations are focused on UCHC achieving excellence in medical and dental education, clinical care and biomedical research (hereinafter referred to as "academic medicine") while strengthening the healthcare system in the region.

OVERVIEW

Like many academic health centers throughout the country, UCHC is at a crossroads. Its hospital infrastructure is deteriorating and it is increasingly difficult to achieve financial margins from clinical operations to support medical education and research. UCHC's need for continued state support to maintain its operations is not unique. John Dempsey Hospital (JDH), with a total of 224 beds of which only 108 are non-encumbered beds, is small compared to hospitals of other peer state-supported schools. UCHC has achieved research, academic and clinical success despite its small hospital, and has established clinical relationships with regional hospitals in order to fulfill its academic mission.

The issue of "developing a clinical base," as stated by Dr. John W. Patterson, the first executive director and second dean of the UConn School of Medicine, was to be a concern with which "the faculty must address itself on a continuing basis for some years to come." As he envisioned, this remains a critical issue today both for the sustainability of UConn's academic medical education programs at UCHC and for its allied health professional schools located in Storrs.

The question of what to do with JDH and the relationships between UCHC and the regional hospitals has been debated since before the medical school was created and the hospital was even built in Farmington. As a result of the need to address the replacement and/or renovation of JDH presents an opportunity in 2008 for UCHC and interested regional hospitals to create a new regional academic medical education network that could ultimately benefit health care throughout the state, as well as reaching a decision on the construction of a replacement clinical facility on the UCHC campus.

There is no question that the hospital environment in the Greater Hartford region is extremely competitive, with hospitals vying for market share for their services. Additionally, the Tripp Umbach Bed Analysis indicates that there are currently, and will be for the foreseeable future, a sufficient number of licensed beds in the region. However, it is also obvious that continued negative discourse over bed needs and market share between UCHC and the regional hospitals is not useful for sustaining productive partnerships to support academic medicine, which UCHC depends on in support of its mission and for its success. It is important to recognize that the financial condition of the hospital industry in the region needs to be taken into consideration in building a new strategy to promote academic health care in the region.

Additionally, it is noted that the Governor's Hospital Task Force, created by Governor M. Jodi Rell in 2007 for the purpose of developing "strategies to stabilize and chart the future course of hospitals in Connecticut, many of which are facing financial hardship," released its report, "Hospital System Strategic Task Force Report: Findings and Recommendations," on January 8, 2008. The recommendations of this report may help to address the financial and workforce issues for health care in the state that are underlying concerns that have been expressed by the regional hospitals and UCHC during this study process.

FINDINGS

The Study Committee utilized the following findings from the study process and analyses in the development of options for consideration:

- Based on the Tripp Umbach analysis, UCHC has "a strong economic impact" on the state's economy.
- Current relationships between UCHC and its regional clinical care partners are neither sufficiently defined nor adequately developed enough to fully support the mission of academic medicine. While UCHC is functioning in a quasi-distributed academic model with affiliated regional hospitals, there is limited mutual vision and support between UCHC and its clinical affiliates with the notable exception of the Connecticut Children's Medical Center. Strong working relationships exist at the institutional and departmental level, but there is not a broad, multi-organizational plan guiding medical education, research and service.
- Continuation of the status quo, i.e., no change in existing relationships with existing clinical care partners and no new or renovated UCHC facilities, jeopardizes the goal, identified by the General Assembly as a major objective of this study, of UCHC achieving excellence in medical education explicitly.
- The existing facilities at JDH are outdated and require investment for replacement and renovation for continued use for academic medicine purposes. Additionally it is noted that
    - the age and condition of JDH from the perspective of academics, research and clinical care will become a deterrent to attracting students, clinicians, faculty and researchers
    - JDH is too small to provide an acceptable level of academic clinical care experiences as a stand-alone academic health center, and its small size also inhibits growth of clinical and translational research programs of benefit to the university and the State.
- The Bed Analysis does not justify the need for additional licensed hospital beds in the Greater Hartford region at this time and for the foreseeable future.

Options

There exist many options for how academic health centers can be organized and governed—"if you have seen one, you have seen one." Medical schools can own and operate their hospital

and faculty practice plan. There are medical schools that do not own their own hospital but still retain ownership of their faculty practice plan. There are medical schools with no owned hospital and no owned faculty practice plan. Each operating structure can be debated on its individual merits regarding its effectiveness and productivity, but there is not one best practice model. Many medical schools have relationships with more than one hospital to provide education for their undergraduate and graduate students outside of their university hospital. While the possibilities are endless, the key to success lies within the institutional relationships, including the governance and organizational structure, and financial relationships. The "Academic Health Centers" description of the "Research Findings" section of the Tripp Umbach Report (Appendix A) provides additional information regarding organizational and ownership structures for academic health centers.

CASE's project consultant, Tripp Umbach, has been involved with creating numerous new medical schools around the country and has found that what works at one academic health center may not work at another. Each situation is unique because of its history, its leadership, its political environment and its goals. However, Tripp Umbach has found that based on their interviews with the top leadership at academic health centers around the United States, the goal is to keep the structure simple. No organization succeeds financially, academically, clinically and in research with 40 governing bodies and complex reporting relationships.

The Study Committee identified two options which achieve the goal of strengthening UCHC and undergraduate and graduate academic medicine in the state. These options were then used to develop the committee's study recommendations.

OPTION 1

This option involves UCHC building a new teaching hospital, either larger or of similar size (352 beds including 128 new beds) to that which has been proposed by UCHC, with vacated space in the existing JDH being renovated for research and academic purposes. Additionally, the alternative siting of a new hospital as suggested by Tripp Umbach should be considered. This option involves maintaining state ownership/management of clinical operations and the facility. The new hospital facility would provide UCHC with an opportunity to strengthen undergraduate and graduate medical education, grow research opportunities and continue to provide high-level clinical care with continued reliance on relationships with clinical care hospital affiliates in support of its mission.

While this option will provide UCHC with a larger, state-of-the art hospital that will be a significant upgrade in hospital facilities, it will also add additional hospital beds to the Greater Hartford region. This option solves UCHC's current hospital facility needs, but does not address its need for the development of strong regional clinical care partnerships to achieve excellence in its academic and research missions. This option involves the following considerations:

- Potential negative financial impacts on hospitals in the Greater Hartford region, including UCHC, since the Bed Analysis for this region does not show any significant growth over the next 15 years.
- Construction of the replacement hospital requires approval of the Connecticut Office of Health Care Access through the State's Certificate of Need process. Statewide and regional bed needs are an important consideration in this process. However, this study's

Bed Analysis does not justify the need for additional licensed hospital beds in the Greater Hartford region. Consequently, justification for the replacement hospital of the proposed or possibly larger size will need to be primarily based on other factors such as the need for a larger hospital facility in order for UCHC to meet academic clinical care needs for its faculty and medical students and for the benefit of the state.

- Even if the replacement hospital of the proposed size or larger is built, UCHC will still need to continue to rely on regional hospital clinical care partners to meet their full suite of academic, clinical and research needs. Negative financial impacts on the regional hospitals and the need for continued commitment and cooperation of regional hospitals to serve as clinical care partners for UCHC may result in continued conflict between UCHC and its regional partners. This could endanger the ability of UCHC to provide necessary quality academic clinical care experiences for its students and opportunities for its research mission.
- Construction of a replacement hospital nonetheless provides much benefit for UCHC despite potential conflict with regional hospital partners. Integration of clinical care, research and teaching on one campus promotes synergy between the three traditional missions of academic health centers and is integral to the bench to bedside (or "T1") research taking place at other integrated health centers nationally.
- Tripp Umbach's analysis revealed that there are numerous examples of medical schools with large clinical facilities owned and operated by a state (e.g., University of Washington and University of Kentucky) within clinically competitive markets. Many of these facilities, much like UCHC, started with small clinical operations but unlike UCHC, continued to grow their clinical capacity. According to Tripp Umbach's findings, these publicly owned and operated academic health centers are some of the top academic, research and clinical enterprises in the country.
- Tripp Umbach's research findings highlight the need for a broader understanding within the Greater Hartford region regarding the value and support of academic medicine.

OPTION 2

This option involves UCHC formalizing, strengthening, and reinforcing relationships with current clinical care partners, and exploring relationships with other interested clinical care partners. This option offers several scenarios regarding construction of new clinical facilities on the UCHC campus that would not necessarily be owned and/or operated by the state. This option would also provide UCHC with an opportunity to strengthen undergraduate and graduate medical education, grow research opportunities and continue to provide high-level clinical care. This option involves the following considerations:

- UCHC leadership has long recognized the importance of its relationships with its clinical hospital partners to provide its students with academic medical clinical care education. However, it is noted that UCHC's past efforts to affiliate with a primary clinical care partner have been unsuccessful, most recently in the late 1990s.
- Best practices identified in the Tripp Umbach report should serve as a foundation for defining and forming successful clinical care partner relationships. Key issues

include governance (department level, administrative level and board level), clinical faculty (core faculty, faculty practice plan(s) and community physicians) and financial arrangements and support between UCHC and its clinical care partners. These relationships must be articulated in formal affiliation agreements that are customized and that specify in detail the commitment to academic medicine that each clinical care partner is willing and able to make.

- Creation of more effective academic clinical alliances would likely enhance UCHC's capacity to conduct translational research designed to bring advances in medical science into medical practice and the community (or "T2"), now viewed as a high priority by the National Institutes of Health via the Clinical and Translational Science Awards (CTSA) program. UCHC's well-defined relationship with the Connecticut Children's Medical Center includes many of the requirements for the development of a successful, sustainable academic medical clinical care partner affiliation.
- Various scenarios regarding the replacement of JDH as a clinical facility should be considered:
    - Clinical (inpatient and/or ambulatory) facilities to be constructed at UCHC would be operated by a selected clinical care partner.
        - Construction/lease options include:
            a. providing the clinical care partner a land lease for the construction of any new clinical facilities, with UCHC renovating the vacated JDH for academic and research uses. The land-lease concept could be similar to that used by the State for the construction of facilities built by businesses located on state airport property, including Bradley International Airport. The land lease and any extension options are of such term to allow for the financing of facilities by the lessee at its expense, with such facilities reverting back to the State at the end of the lease term and any extensions thereof; or
            b. UCHC building the new and renovated UCHC facilities and then leasing the clinical facilities to the selected clinical care partner.
    - Evaluation of the best clinical hospital site for the placement of beds currently dedicated to corrections, psychiatry, neonatal intensive care, and high risk pregnancy will need to be taken in consideration.
    - Exploration of various options for the renovation/replacement of JDH:
        - Determination of the type of clinical facilities to be constructed on the UCHC campus by UCHC and its selected clinical care partner. This should include consideration of building an in-patient hospital facility and/or ambulatory facilities that takes into consideration market factors, UCHC's education and research missions and the viability of the clinical care partner's business plan.
            - Construction of a replacement hospital of a size to be determined on the UCHC campus with the number of beds being based on JDH's existing licensed beds and the reallocation of some licensed

beds of UCHC's selected clinical care partner to this new hospital facility. This may be able to be accomplished without impacting the number of staffed beds of the participating clinical care partner at its principal hospital, thereby not increasing the number of licensed beds in the Greater Hartford region.

- ◊ Close JDH facility and renovate vacated space for academic and research purposes and move all clinical care operations currently provided at JDH to a selected clinical care partner hospital.

- ◆ Construction of additional ambulatory clinical facilities on the UCHC campus with or without a limited number of replacement hospital beds.
- ◆ Construction of any new clinical facilities on an alternative site as proposed in the Tripp Umbach report as a part of a broader UCHC campus master planning initiative.

- ○ Labor-related issues will need to be resolved.

- Direct negotiations or an RFP/RFQ process can be used by UCHC to form the necessary clinical care hospital partner agreements to produce an effective clinical care network and relationships in support of its academic medicine mission and a clinical care partner to construct clinical facilities on the UCHC campus. However, given the poor track record of such efforts in the past, a time schedule should be established, and a monitor (independent third party) should be appointed to report on progress and results to the General Assembly to ensure that the best interests of the State are considered.
- Tripp Umbach's analysis identified numerous examples of this model throughout the United States that have achieved success.

The development of an effective framework in which UCHC can flourish as a leading and nationally recognized academic and research center is critical to its success. To accomplish this goal it is necessary for UCHC and its regional partners to have a common vision of academic medicine that is integral to each partner's clinical care operations in order to achieve and sustain the collective mission of excellence in academic medicine.

The Study Committee maintains that regardless of the option selected, UCHC should have a strong voice in determining its destiny. The key to success in this endeavor is collaboration and mutual vision of academic medicine. Also, it is critical to note that UCHC, as the state-owned and operated academic health center, should be expected to require continued financial support from the State to maintain its education and research missions.

COMMITTEE RECOMMENDATIONS

The Study Committee's recommendations are intended to be useful in shaping and motivating productive discussions among multiple parties with a goal of developing a productive regional environment for academic medicine and research. It is noted that UConn and its affiliated clinical care partners recently have been engaged in discussions in an attempt to address the issues that are the topic of this study.

The Study Committee believes that a continuation of the status quo, i.e., no change in existing relationships between UCHC and existing partners and no new or renovated UCHC facilities, jeopardizes the General Assembly's goal of UCHC achieving excellence in academic medicine and is not in the best interests of the state.

The Study Committee's recommendations offer an optimal solution given the

- overarching goal for UCHC to be an academic health center of excellence producing dentists and doctors interested in practicing in Connecticut, and being recognized as a national leader in biomedical research
- dynamics of UCHC's long history of reliance on regional hospitals for a significant portion of its medical student's academic clinical care education
- existing competitive healthcare environment in a low- to no-growth region of the United States

Based upon the factors cited, the Study Committee recommends that efforts should immediately be focused on the implementation of Option 2. The Study Committee believes that there now exists an opportunity to create a new academic healthcare delivery system in the Greater Hartford region. Now is the time to look at new visionary ways to educate students, nurses and allied health professionals as parts of interdisciplinary teams and to truly support the academic, research and clinical mission of UConn.

This solution best provides for the full range of UCHC's clinical needs, simultaneously offering opportunities for its clinical care partners while reducing or eliminating possible negative financial impacts on the regional hospitals. Importantly, the Study Committee believes that its recommendations not only will provide UCHC the best opportunity to be fully recognized as an asset to the healthcare systems of the Greater Hartford region and the state, but also offer the potential for significant growth in economic impact as a result of its activities.

The strength of Option 2 is the focus on collaboration between UCHC and its regional partners. Option 2 involves formalizing, strengthening and reinforcing existing clinical hospital affiliate relationships. In order to further articulate Option 2, it is essential to define the term "primary clinical affiliate." The primary clinical affiliate of a medical school is the healthcare institution most closely affiliated with the clinical, educational, and research programs of the school. It is the site where most of the full-time physician faculty (employed by the school) practice medicine; teach medical students, residents, and fellows; and conduct clinical and translational research.

UCHC could have more than one primary clinical care affiliate as long as full-time faculty are heavily involved and the governance and financial requirements are clearly articulated in affiliation agreements that provide the basis for effective and sustainable relationships. Some primary clinical affiliates could provide components of clinical relationships (e.g., programs and joint facilities in specific clinical areas); these relationships would be invaluable in creating a comprehensive academic healthcare system in the region, such as and in the spirit of the existing relationship between UCHC and the Connecticut Children's Medical Center. As previously mentioned, the goal of all primary clinical affiliates must be to support academic medical education and to provide supplemental financial support for UCHC's educational and research missions.

As stated in Tripp Umbach's analysis, key issues to resolve in the development of effective sustainable clinical affiliate relationships include, among others, governance and financial perspectives and faculty relationships:

Governance and Financial Considerations

1. Legal form for the relationship between UCHC and its clinical care partners
2. Potential joint venture issues related to governance need to be considered, such as:
    a. Decision-making structures between UCHC and its clinical care partners and associated faculty practice(s)
    b. Responsibilities and authority for specific actions and decisions
    c. Physician relationships and responsibilities
    d. Financial obligations and funding arrangements (annual budget line item contribution from primary clinical affiliates to UCHC)
    e. Board and committee appointments
    f. Strategic planning
    g. Liability and insurance
    h. Leases and facilities
    i. Dispute resolution

Faculty Relationships

1. Terms of clinical affiliation and practice plan arrangements (services, compensation, billing and collections, scope of clinical education oversight, student assessment obligations, credentialing requirements, medical education, residency training and fellowship programs)
2. Faculty appointment and requirements (core faculty, associate faculty, adjunct faculty and community physicians)
3. Organizational structure (departments and relationships to UConn academic program leadership and reporting relationships)
4. Relationship to residency training and fellowship programs; resident involvement in student training
5. Qualifications under federal and state laws (state provisions for teaching, federal program (Medicare/Medicaid) participation

This model is not without its challenges. Governance and financial commitments need to be formalized through affiliation agreements that clearly articulate the relationship and

commitments between UCHC and its clinical care hospital partners. The difficulty of achieving a productive, workable and sustainable collaboration should not be underestimated. All parties have to be willing to negotiate to achieve a new and mutually agreed upon vision of collaboration for the benefit of improving academic medicine in the region. It is important to recognize that UConn's clinical care mission as the state's academic medical center and the clinical care mission of the regional community hospitals have not been traditionally aligned. Therefore it is critical that the relationships created must ensure a commitment to academic medicine from regional hospitals that participate with UCHC as teaching hospitals.

Additionally, the Study Committee believes that there is a market for clinical healthcare facilities on the UCHC campus that should be owned and/or operated by a selected clinical care hospital partner. Having clinical facilities in close proximity to UCHC's principal academic and research base, along with that of the principal hospital of the selected hospital operating partner, will be an important asset to UCHC and its faculty in achieving their educational and research goals.

It is suggested that a two-step process be utilized to implement these recommendations, and that an independent monitor be named by the General Assembly to report on the progress and outcomes of the process to ensure that the best interests of the State are taken into consideration:

1. The initial step in the process involves UCHC and regional hospital partners working together to develop a mutual vision and spirit to support the healthcare and academic medicine missions of UConn. There is common ground upon which to build this understanding, as the regional hospitals and UCHC have been working together for years educating students and residents. Since this initiative will impact the culture, policies and priorities of the regional hospitals and UCHC, it will be critical to involve the boards, chief executive officers and leadership teams of each participating organization in order to establish an overriding framework that will result in the recognition that medical education will be a top priority for each of the UCHC clinical care hospital partners.

   This step in the process should at a minimum include the development of guiding principles that will form the basis for establishing comprehensive affiliation agreements between UCHC and its regional hospital partners regarding the following:

   a. UCHC's role in the state, region and community
   b. the value of undergraduate (dental and medical) and graduate medical education and the potential expansion of both programs
   c. potential cross-educational programs with allied health professional schools located at UConn's Storrs Campus and public health professionals, and development of new ways to team train all healthcare students
   d. potential of research and how research collaboration could elevate the entire economy of the region and state
   e. identification of what is necessary to strengthen academic medical education in the state

The outcomes of these discussions should be articulated in a memorandum of understanding that highlights key points of agreement and support of medical education at multiple levels. It is suggested that this effort should be completed within a two-month period.

2. The next step in this process involves an RFP/RFQ process conducted by UCHC to select and articulate the detailed working relationships with interested clinical care hospital partners to support the academic mission of UConn within the context of providing the best possible solution to support medical education in the state. This process needs to takes into consideration the needs of the stakeholders: UCHC, regional hospitals, and the residents of the state of Connecticut. This process will also need to include decisions on the type of clinical facilities and clinical services that will be provided on the UCHC campus. It is suggested that a six-month period be provided to accomplish this task.

In summary, the Study Committee recommends that the following considerations guide the implementation of Option 2:

- An RFP/RFQ process should be conducted by UCHC to select clinical care partners utilizing measures that will help to assure sustainability of the relationships under a variety of potential operating and economic conditions.
- A Monitor should be appointed by the General Assembly to report on the two-step implementation process and its progress, with a goal of concluding the RFP/RFQ process and executing final clinical care hospital partner agreements within the suggested 180-day period. These affiliation agreements should include strong and clearly defined:
    - governance structures between UCHC and its clinical care hospital partners
    - financial commitments between UCHC and its clinical care hospital partners which guarantee the support and maintenance of academic medicine
    - the articulation of commitments from clinical care hospital partners to the academic and research mission of UCHC
- The State should sustain its financial support of the UCHC medical and dental schools to ensure continuing excellence in academic medicine
- Clinical facilities—inpatient and/or ambulatory—on the UCHC campus should be built, and operated by a clinical care hospital partner selected through the RFP/RFQ process, with UCHC providing its partner with a land lease on which the partner, at its expense, would construct the new facility. Consideration should be given to constructing any new clinical facilities on an alternative site on the UCHC campus, as suggested in the Tripp Umbach report; with the requirements for the type of clinical care services to be provided at this new facility being determined through the RFP/RFQ process. Under this scenario, the existing vacated JDH would be renovated by UCHC for research and academic purposes.
- Existing licensed beds currently allocated to JDH and those beds that the selected clinical care hospital partner could reallocate to a new hospital under its existing license will likely be sufficient for new clinical facilities that would be located on the UCHC

campus without seeking any increase in the total number of licensed beds of the two existing hospitals

CONCLUDING REMARKS

The study process put in place by the General Assembly has encouraged renewed discussions between UCHC and several regional hospitals. It is in the best interest of UCHC and the regional hospitals to develop a system that will enable UCHC to flourish as a comprehensive academic health center of excellence for the benefit of the region and the state. The elimination of UCHC as a clinical care provider and competitor with the regional hospitals will remove a significant obstacle to the development of sustainable partner relationships. However, the Study Committee also strongly suggests that the General Assembly establish, as recommended, a workable, but aggressive, timetable to reach a successful conclusion to UCHC's selection of its clinical care hospital partners and the articulation of these relationships in affiliation agreements, as well as the selection of a clinical care partner to construct, own and operate new clinical facilities on the UCHC campus.

Further, it is suggested that in the development of the vision of academic medicine, consideration should be given to building upon UCHC's innovative 1st and 2nd year common curriculum for its dental and medical school students. There exists the opportunity to consider the development of a new approach to the clinical education of medical students that focuses on inter-professional education by placing medical students in teams with other healthcare professionals during their clinical rotations. Through the promotion of teamwork and inter-professional training, students will be able to be trained in a clinical environment that is characteristic of the current healthcare delivery system. If this is accomplished, UCHC and the Greater Hartford region would be at the cutting edge of training for the next generation of healthcare professionals.

APPENDIX A
TRIPP UMBACH REPORT

TrippUmbach
research ▪ strategy ▪ impact

Research Findings

Submitted to the Connecticut Academy of Science and Engineering Study Committee

February 2008

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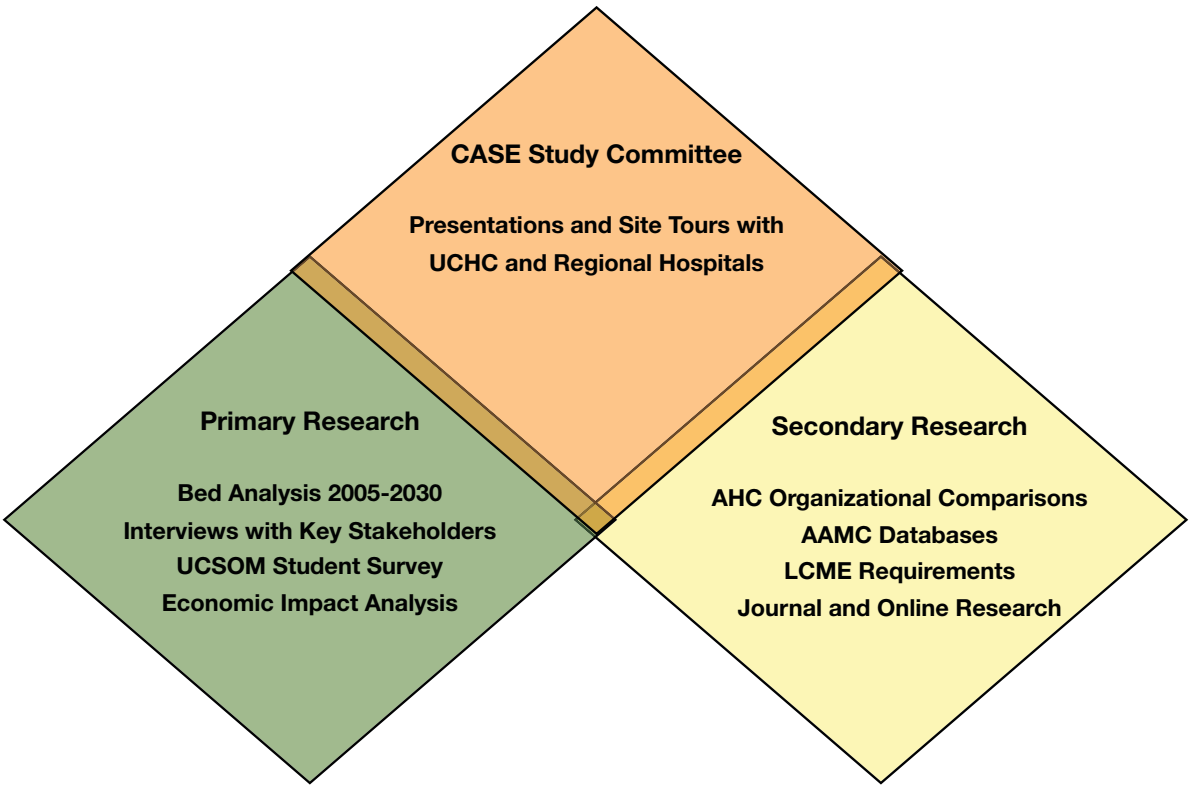
Project Background

In October 2007, Tripp Umbach was retained to complete research for the Connecticut Academy of Science and Engineering on the proposed expansion of the University of Connecticut Health Center. The diagram below depicts the process and methodology utilized by Tripp Umbach to complete this study. To complete this assignment Tripp Umbach communicated regularly with CASE Study Committee leadership, attended UCHC regional hospital meetings and presentations, and worked collaboratively with CASE throughout the process.



Tripp Umbach completed both primary and secondary research to assist in the development of this report. Primary research completed by Tripp Umbach included: bed needs analysis for the state of Connecticut, Greater Hartford Region and John Dempsey Hospital Primary Service area; Interviews and meetings with regional hospital and UCHC leadership; University of Connecticut

School of Medicine student survey and economic impact analysis. Tripp Umbach also completed extensive secondary research tapping into its previous experience with academic health centers as well as Association of American Medical Colleges (AAMC) databases, Liaison Committee on Medical Education (LCME) requirements, research of other medical schools and pertinent journal articles. This report is a summary of all findings in the study. Within the appendices of this report, all PowerPoint presentations are presented for review.

University of Connecticut Health Center

The University of Connecticut Health Center, situated in suburban Farmington on the 160 acre campus of the University of Connecticut Health Center, includes the School of Medicine, the School of Dental Medicine, and the Graduate School in the Biomedical Sciences, the John Dempsey Hospital, UConn Medical Group, UConn Health Partners and University Dentists. There are master's degree programs in public health (MPHS) and dental science, postdoctoral fellowships, residency and fellowship programs providing specialty training for newly graduated physicians and dentists, and continuing education programs for practicing healthcare professionals. Overall, UCHC employs 5,200 staff (CT's 16th largest employer) and has a budget of $712 million. UCHC has all three aspects of an academic health center represented on its campus: academic, clinical and research.

The Schools of Medicine and Dental Medicine have 577 paid faculty FTE's (full-time equivalents). Many more faculty who are involved in teaching programs for medical students and residents are located at affiliated hospitals -- The Hartford Hospital, St. Francis Hospital and Medical Center, Hospital of Central Connecticut and the Children's Hospital Medical Center (CCMC). Medical students, residents and fellows all train on the Health Center's main campus and in these affiliated hospitals. Intern and residency programs are essential to the hospitals in the region. With almost 600 residents in UCHC programs throughout the region, the trainees provide necessary coverage for affiliated hospitals and provide the next generation of physicians to serve Connecticut's population.

University of Connecticut School of Medicine

The school's classes consist of a maximum of 80 students per year which is a moderately sized school in comparison to the national medical school market. The table below details the applications and matriculants by medical school in Connecticut by the state of legal residence and sex of applicants. The majority of matriculated students at UConn come from the state of Connecticut.

US Medical School Applications and Matriculants by School, State of Legal Residence and Sex, 2007					
AMCAS Year 2007	Applications	Applications			
		State of Legal Residence		Sex	
		% in state	% out of state	% female	% male
Connecticut	2976	13.9	86.1	49.8	50.2
Yale	5021	4.2	95.8	45.7	54.3
AMCAS Year 2007	Matriculants	Matriculants			
		State of Legal Residence		Sex	
		% in state	% out of state	% female	% male
Connecticut	81	86.4	13.6	59.3	40.7
Yale	99	14.1	85.9	47.5	52.5
Source: AAMC Database, 2007					

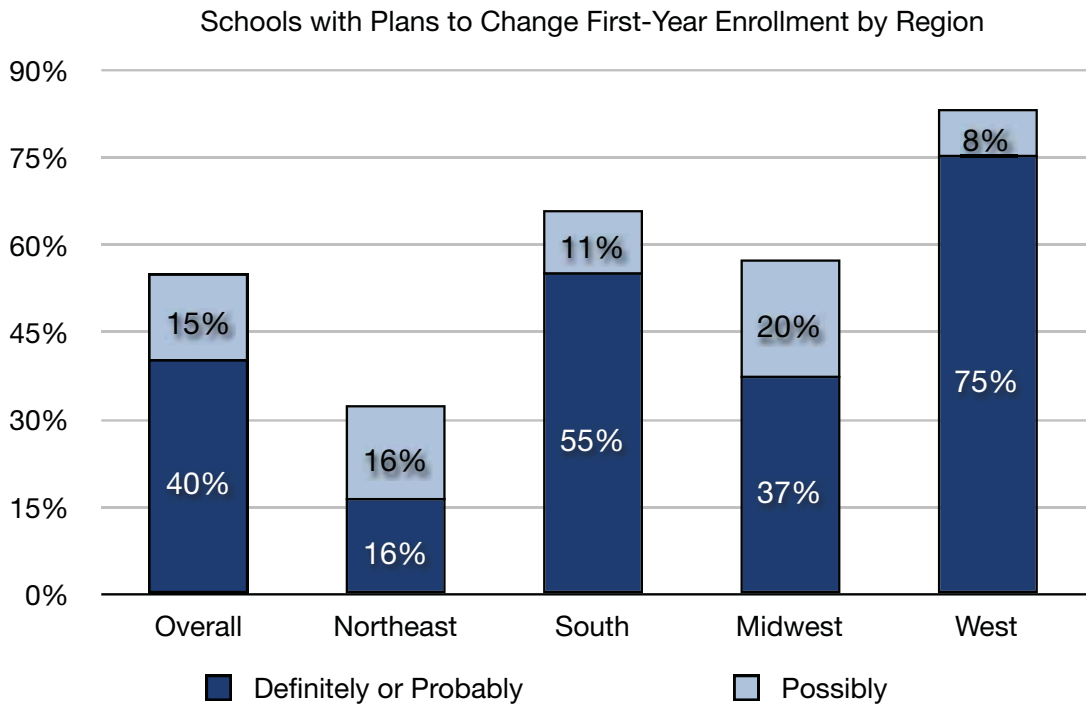
The table below provides the total number of medical school graduates in the state of Connecticut by sex, from 2002 through 2007. It is noteworthy that while many schools throughout the United States are working to increase class size, numbers at both the public and private medical schools in Connecticut have not increased. However, interest has been expressed by University of Connecticut School of Medicine to increase class size to 88.

Total Graduates by CT Medical School and Sex, 2002-2007																		
	Class of 2002			Class of 2003			Class of 2004			Class of 2005			Class of 2006			Class of 2007		
	F	M	All	F	M	All	F	M	All	F	M	All	F	M	All	F	M	All
CT	34	43	77	44	36	80	39	29	68	39	34	73	41	35	76	52	24	76
Yale	55	57	112	36	61	97	52	57	109	46	49	95	57	44	101	43	44	87
Source: AAMC Database, 2007																		

Growing Medical Education

In 2005, the AAMC issued a policy recommendation that medical college enrollment increase by 15%, or 2,500 first-year students, and that the increase focus on areas of the country where shortages are particularly acute. Most recently, in June 2006, the AAMC endorsed a 30% increase in enrollment by encouraging all members, regardless of location, to consider enrollment increases.

The AAMC recently surveyed existing US allopathic medical colleges to determine capacity for increasing medical college enrollment. The importance of medical education continues to be critical for the future of academic medicine. Survey results indicate that the total number of new graduates from existing colleges which are planning increases in enrollment and the five new allopathic colleges that are likely to open in the next five years will be between 1,121 and 1,400 graduates each year. Even at the highest end of this estimate, these numbers fall short of the 15% increase currently requested by the AAMC (2,500 new graduates) or the expected 30% increase (5,000 new graduates). However, in the Northeast region the percentage of schools with plans to change first-year enrollment is the lowest.



Source: AAMC, Analysis in Brief, April 2006.

Several other studies, including one completed by the Council on Graduate Medical Education (COGME)[1] which calls for an increase of 3,000 medical college graduates by 2015, also recommend an increase in medical college graduates to meet the nation's health care needs. Relative to the need for additional practicing physicians, most experts reference one of two estimates of physician shortages. Edward Salsberg, a national health workforce expert, completed a study in 2003 for the Council on Graduate Medical Education and concluded that there will be a national shortage of 85,000 physicians by 2020. In late 2003, Dr. Richard Cooper[2] published an article estimating that there will be a deficit of 200,000 physicians by 2020[3].

In addition to the need to address overall physician shortages, there are other issues causing concern in the medical education profession. These include an increased reliance on International Medical Graduates (IMGs), and more specifically, the 22% of IMGs who are educated in Caribbean and Central American medical colleges. While the quality of care provided by the majority of IMGs is not in question, IMGs as a whole are more likely to practice in large cities rather than in non-urban areas of the country where the greatest need for physicians exists[4]. Additionally, questions have been raised by medical education experts relative to America's dependency on other countries to educate physicians practicing in the US, and the draining of highly educated physicians from countries which have far fewer health care resources than America.

Quality of care is a concern relative to students educated in Caribbean or Central American medical colleges. Lack of access to American medical colleges is thought to be the reason behind the growing number of American students who attend medical colleges in developing Caribbean or Central American nations. An estimated 1,200 US citizens graduate each year from offshore colleges and return to the US to practice. Because the offshore medical colleges do not have to meet the requirements set by the Liaison Committee for Medical Education (LCME)[5], there is no way for the US to monitor the quality of the medical education provided by these colleges.

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[1] "Physician Workforce Policy Guidelines for the United States, 2000-2020" presented by the Council on Graduate Medical Education in January 2005.

[2] Richard A. Cooper, MD is a former dean and executive vice president of the Medical College of Wisconsin (1984-1994) and Health Policy Institute director (1994-2005). Dr. Cooper is one of the world's preeminent voices on physician supply. He has been professor of medicine and a senior fellow in the Leonard Davis Institute of Health Economics at the University of Pennsylvania in Philadelphia since 2005.

[3] Annals of Internal Medicine 141:705-14, 2004.

[4] According to Gary Hart, Director of the University of Washington Center for Health Workforce Studies and Rural Health Research Center.

[5] LCME is a collaboration between the American Medical Association and the AAMC, created to monitor the accreditation of American medical colleges.

Finally, changing lifestyles and demographics are impacting the physician workforce in our country. As noted in Dr. Cooper's article referenced above[6], the percentage of physicians who are women has increased steadily throughout the past decade. By 2020, it is estimated that 45% of practicing physicians will be women. Women physicians practice an average of 20% to 25% less than their male counterparts. Physicians as a whole are also placing a greater priority on lifestyle considerations, resulting in a workforce that differs from previous generations of physicians in its work patterns.

No one contests that there is a shortage of primary care physicians in the United States. Moreover, this shortage is growing. According to a 2007 report by the Center for Studying Health System Change (a non-partisan policy research organization based in Washington D.C.), "As the US population ages and many of the 76 million baby boomers develop multiple chronic conditions, an adequate supply of primary care physicians will be critical to meet the nation's health care needs."

While these needs are growing, the supply of physicians is shrinking as a proportion of the population. The AAMC projects that there will be a 27% decline in the number of physicians per 100,000 population between 2000 and 2030. Based on this projection, the AAMC has called for a 30% increase in medical school enrollment over that period.

At the same time that physicians are seeking a more balanced lifestyle, the nature of the care provided by these physicians is increasing in complexity. Routine care has in large part been delegated to others such as registered nurses, physician assistants, and nurse practitioners. The issue of allied health professional shortages is also of great relevance to the US and in Connecticut. In 2001, the average physician saw 17% more patients older than age 45 than the average physician saw in 1992. During this same time, the average number of diagnoses per visit increased by 13% and the average number of drug mentions increased by 18%.

All of these factors contribute to an increasing amount of stress for physicians. Many have chosen to reduce patient volumes or have taken non-clinical jobs. Further, Dr. Cooper notes that an alarming number of physicians in their 50s are retiring or contemplating early retirement, adding to the physician shortage crisis. The chart below demonstrates that the age of physicians in Connecticut is nearly identical to that of the US.

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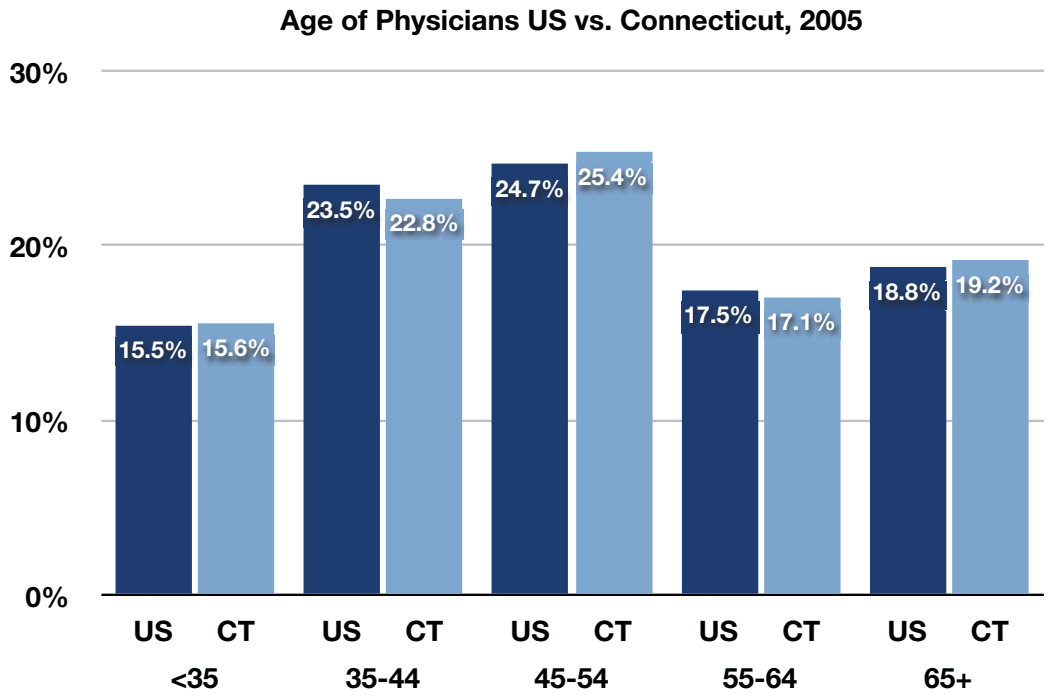
[6] Cooper, Richard; Stoflet, Sandra; and Wartman, Steven, "Perceptions of Medical School Deans and State Medical Society Executives About Physician Supply," Journal of the American Medical Association, Vol. 290, No. 22, December 10, 2003, p. 2992-2995.



Source: AMA, Physician Characteristics, 2007

It is clear that limited medical college capacity, physician demographics and physician lifestyle changes in conjunction with the aging and decreasing health status of the US population are all significantly impacting the physician and allied health workforce. The case for supporting medical education is stronger than ever within the US and within the state of Connecticut. In examining specific physician workforce characteristics in the state of Connecticut, there are 11,161 physicians involved in patient care. The table on the next two pages provides detailed breakdowns of number of physicians by type.

Tripp Umbach Research Findings

		Patient Care				Other Professional Activity			
				Hospital Based					
Specialty	Total Physicians	Total Patient Care	Office Based	Resid/ Fellows	Phys. Staff	Admin	Med. Teach.	Research	Other
Total Physicians	**14,234**	**11,161**	**8,438**	**1,696**	**1,027**	**312**	**188**	**334**	**80**
GP/FM Practice	**610**	**588**	**501**	**53**	**34**	**12**	**7**	**2**	**1**
Family Medicine	546	525	443	53	29	11	7	2	1
General Practice	64	63	58		5	1			
Med. Practice	**5,344**	**4,937**	**3,642**	**883**	**412**	**117**	**96**	**174**	**20**
Allergy & Immunology	75	62	56	4	2		2	8	3
Cardiovascular Disease	375	357	296	35	26	7	4	6	1
Dermatology	187	184	161	16	7			3	
Gastroenterology	230	213	181	20	12	2	7	7	1
Internal Medicine	3,131	2,866	1,997	620	249	81	61	111	12
Pediatrics	1,119	1,055	805	157	93	21	13	27	3
Pediatric Cardiology	23	22	17	5			1		
Pulmonary Disease	204	178	129	26	23	6	8	12	
Surgical Specialty	**2,508**	**2,437**	**1,995**	**333**	**109**	**25**	**18**	**20**	**8**
Colon & Rectal Surgery	21	20	19	1				1	
General Surgery	556	532	357	144	31	8	8	4	4
Neurological Surgery	85	83	66	13	4		1	1	
Obstetrics & Gynecology	709	688	573	76	39	10	3	7	1
Ophthalmology	316	307	291	9	7	1	2	4	2
Orthopedic Surgery	366	361	303	46	12	1	2	1	1
Otolaryngology	143	141	122	11	8	1		1	
Plastic Surgery	94	93	81	9	3	1			
Thoracic Surgery	68	64	56	5	3	3	1		
Urology	150	148	127	19	2		1	1	
Other Specialty	**3,613**	**3,199**	**2,300**	**427**	**472**	**158**	**67**	**138**	**51**
Aerospace Medicine	4	2	2	27		2			
Anesthesiology	519	499	426	12	46	4	12	3	1
Child & Adolescent Psych	166	153	121	71	20	5	3	5	
Diagnostic Radiology	402	383	291	78	21	5	5	2	7
Emergency Medicine	397	374	176	2	120	17	4	2	
Forensic Pathology	8	4	1	2	1	1			3
Gen. Preventive Medicine	36	32	23	9		2	1	1	
Medical Genetics	12	8	7	1				4	

Tripp Umbach Research Findings

Specialty	Total Physicians	Total Patient Care	Office Based	Resid/ Fellows	Phys. Staff	Admin	Med. Teach.	Research	Other
Neurology	212	194	156	24	14		2	15	1
Nuclear Medicine	30	23	18	5				4	
Occupational Medicine	55	31	26		5			3	7
Psychiatry	962	853	594	106	153			41	4
Public Health/GPM	16	2	2			6	1	5	2
Physical Medicine & Reh.	79	73	62	2	9	3	1		2
Pathology	348	286	187	48	51	21	12	17	12
Radiology	121	114	99	2	13	1	3	2	1
Radiation Oncology	69	65	52	9	4	1		3	
Transplant Surgery	2	1	1					1	
Other	109	42	32		10	28	2	26	11
Unspecified	66	60	24	31	5	1	1	4	
Not Classified	705								
Inactive	1454								
Note: Excludes Address Unknown, Subspecialties in this table are condensed into major specialties.									
Source: American Medical Association, Physician Characteristics and Distribution in the US, 2007 Edition. 2005 Data									

AAMC Benchmarking Data
US Medical School Hospital Benchmarking Analysis

The objective of the benchmarking analysis is twofold:

1. To compare US LCME accredited public medical schools in relation to hospital beds and revenue sources to show the financial realities of different public medical school and hospital ownership models; and

2. To look at ownership and organizational models of all integrated academic health centers.

Public Medical Schools

Those medical schools that own their primary teaching hospital (Table I) are shown separately from those with separate non-profit or some other non-owned model (Table II). Schools with no primary hospital (distributed model) are also shown (Table III). The major sources of medical school revenue -- state and local, federal, and hospital -- are shown for each. The hospital dollars are not the total hospital income, only the amount contributed to the medical school for support of graduate medical education and other programs. The tables are sorted by federal revenue generated, which for medical schools is comprised mostly of NIH research grants. NIH ranking, which includes 126 public and private schools, is listed separately. Federal fund/NIH rankings are strongly related to the national standing of medical schools' academic and other programs. Federal funds also generate the greatest economic impact for the receiving state. Other than the US News & World Report rankings, Tripp Umbach is not aware of other rating systems outside NIH funding to rate US medical schools.

Among schools that own their hospitals (Table I), there is a strong relationship between bed capacity and academic productivity. None of the top 10 schools has less than 450 beds and only 2 of the second 10 are under 400 beds. The top 3 schools (UW, UCSF, UCLA) list 2 primary hospitals but many of the others also control non-owned public (county, Veterans Administration) hospitals on or near their main campus. Among the schools with hospitals separate from their university (Table II) the bed capacities are much more variable. As a group these institutions are substantially less academically productive than the owned hospital group. None are in the NIH top 20 and only 9 in the top 50. The schools without primary teaching hospitals (Table III) place a low priority on research and, as expected, group at the bottom.

The University of Connecticut does surprisingly well in these comparisons despite a very small hospital and no adjacent county or VA hospital. UConn's $62M in federal funds and NIH rank of

63rd competes with those who enjoy hospitals twice as large. The two institutions with smaller hospitals rank 96th and 118th respectively. Connecticut might want to consider the history of Washington, another state with a single public medical school. The UW University Hospital opened 175 beds in 1959 and gradually expanded to 360 by the early 1960s. A new bed tower built in 1984 increased the beds to 400 and addition of another floor in 1995 took the hospital to its current capacity of 450. Washington is currently the top public medical school for federal funding (Table I) and for the last 25 years has rarely, if ever, been out of the top 5. The University of Connecticut is not unusual in starting with a small university hospital. They are unusual in staying at the same size for so long.

Table I. US Public Medical Schools - Primary Hospital Owned

2006 Revenues by Source[a] - Ranked by federal support

	State & Local	Federal	NIH Rank	Hospital	# Beds[b]
U Washington	$74,853,314	$619,071,210	6	$247,632,151	759[c]
UC San Francisco	$107,337,673	$515,597,570	3	$175,792,528	1134[c]
UCLA	$173,854,519	$474,116,901	7	$153,027,686	799[d]
Michigan	$39,847,016	$283,843,823	10	$175,213,136	807
UC San Diego	$39,711,648	$276,799,829	16	$83,026,688	470
Alabama	$137,086,354	$255,401,103	18	$73,599,926	908
North Carolina	$74,459,096	$236,943,983	17	$79,161,667	703
Oregon	$8,559,520	$203,971,306	24	$80,199,973	466
Virginia	$33,119,898	$147,708,912	33	$89,948,677	572
Iowa	$76,353,964	$141,304,518	30	$73,531,224	646
Ohio State	$36,994,740	$115,892,119	45	$129,308,648	915
UT Galveston	$78,838,396	$115,494,620	38	$108,155,360	683
MU South Carolina	$71,116,410	$110,734,110	52	$55,781,352	596
Utah	$25,921,053	$106,431,113	43	$72,652,082	441
Illinois	$74,547,001	$103,430,784	48	$48,907,930	459
UC Irvine	$19,252,920	$89,997,135	49	$50,815,806	352
Arkansas	$48,662,880	$88,409,252	69	$46,862,642	342
Kentucky	$37,793,947	$84,655,855	57	$74,477,712	462
UC Davis	$47,271,131	$81,323,176	44	$60,728,515	565
Stony Brook	$49,094,278	$78,488,450	65	$83,800,986	494
New Jersey	$96,900,021	$62,918,149	64	$109,985,400	479
Connecticut	**$62,043,500**	**$62,162,847**	**63**	**$38,957,549**	**224[e]**
Penn State U	$10,925,554	$48,416,596	70	$21,506,032	453
SUNY Downstate	$81,866,065	$31,317,390	90	$181,419,969	627[c]
Missouri Columbia	$23,380,500	$28569552	93	$52,176,461.00	280
SUNY Upstate	$63,139,680	$27565008	94	$44,172,367.00	351
Mississippi	$91,756,800	$25841155	98	$32,434,991.00	601
U Toledo (MU Ohio)	$32,417,000	$17309000	96	$26,597,000.00	216
South Alabama	$29,902,886	$12675555	107	$28,356,593.00	313

a - American Association of Medical Colleges (AAMC) data
b - American Hospital Association (AHA) data
c - Includes second primary hospital (AAMC list), separate ownership
d - Includes second primary hospital (AAMC list), common ownership
e - Current count provided by UConn

Table II. US Public Medical Schools - Primary Hospital Separate

2006 Revenues by Source[a] - Ranked by Federal Support

	State & Local	Federal	NIH Rank	Hospital	# Beds[b]
Colorado	$6,071,335	$310,758,241	22	$114,613,333	467
Maryland	$82,243,676	$204,667,183	25	$116,122,069	647
Cincinnati	$14,311,601	$204,540,642	42	$78,240,913	452
UT Southwestern	$121,524,571	$202,475,136	21	$49,022,982	1234[c]
Wisconsin	$45,367,769	$154,053,293	28	$74,713,110	468
Minnesota – Twin Cities	$93,125,553	$148,136,248	31	$89,138,228	813[c]
Massachusetts	$40,772,521	$128,626,111	39	$64,023,377	711
Florida	$39,769,153	$126,046,317	50	$132,470,345	621
Indiana	$36,350,315	$115,600,574	41	$107,240,676	1845[c]
Wayne State	$53,110,265	$91,486,574	56	$101,250,364	380
UT San Antonio	$92,811,878	$86,418,464	53	$110,516,809	298
Arizona	$52,988,000	$84,810,000	55	$23,220,000	347
UT Houston	$79,157,661	$79,105,740	62	$39,376,703	773
Virginia Commonwealth	$43,170,530	$78,734,260	58	$103,409,676	701
New Mexico	$47,259,563	$76,335,849	67	$73,481,660	300
New Jersey - RWJ	$94,104,111	$72,616,554	66	$31,382,825	584
South Florida	$36,178,029	$65,087,079	74	$69,261,037	877
Vermont	$9,607,558	$62,881,998	61	$15,104,100	430
Buffalo	$80,984,616	$61,799,219	84	$69,398,948	1691
Kansas	$83,197,365	$54,727,138	81	$30,562,795	465
Louisville	$40,370,462	$54,442,770	73	$69,546,987	314
Oklahoma	$38,889,697	$53,796,574	76	$78,832,620	611
Nebraska	$86,884,081	$50,331,784	79	$56,253,691	528
Tennessee	$51,869,428	$50,082,218	68	$61,746,823	370
MC Georgia	$78,694,564	$42,162,066	77	$44,120,712	461
West Virginia	$43,082,099	$21,357,128	103	$36,574,115	466
Texas A & M	$22,963,798	$13,125,413	93	$29,930,229	501
Missouri – Kansas City	$4,083,180	$10,621,038	118	$0	212
East Carolina	$51,917,275	$6,132,881	120	$38,952,601	761

a - American Association of Medical Colleges (AAMC) data
b - American Hospital Association (AHA) data
c - Includes more than one primary hospital (AAMC list)

Table III. US Public Medical Schools - No Primary Integrated Hospital				
2006 Revenues by Source[a] - Ranked by federal support				
	State & Local	Federal	NIH Rank	Hospital
Uniformed Services-Hebert	$0	$226,708,930	No Ranking	$0
Hawaii - Burns	$21,803,798	$39,176,497	91	$16,655,734
Michigan State	$31,478,335	$35,989,527	104	$11,683,920
Puerto Rico	$62,642,043	$33,250,940	86	$6,499,598
LSU New Orleans	$74,579,313	$24,773,446	75	$79,124,132
Nevada	$30,232,862	$22,792,313	101	$29,299,097
West Virginia (Edwards)	$43,082,099	$21,357,128	113	$36,574,115
South Dakota (Sanford)	$10,634,899	$19,622,348	105	$8,206,159
North Dakota	$15,685,671	$18,304,057	109	$5,404,393
Wright State - Boonshoft	$17,919,944	$17,494,999	106	$66,369,320
South Carolina	$21,558,558	$16,425,595	112	$25,157,295
LSU Shreveport	$44,417,596	$16,168,718	102	$52,782,179
East Tennessee - Quillen	$29,449,100	$14,180,730	121	$18,391,710
Texas Tech	$89,515,118	$8,509,029	117	$33,690,917
Southern Illinois	$56,624,000	$6,976,400	111	$27,819,100
Northeastern Ohio	$16,573,275	$3,973,388	122	$12,657,021
Florida State	$30,915,640	$1,766,552	No Ranking	$0

a - American Association of Medical Colleges (AAMC) data

Academic Health Centers

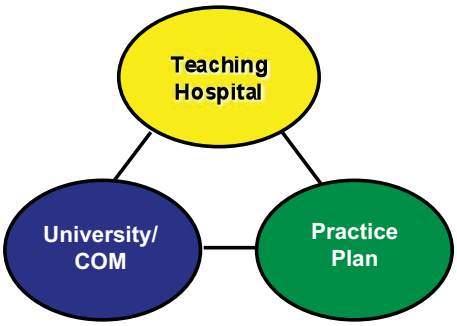
There is great diversity in organizational and ownership structures for academic health centers throughout the United States. As noted in the above tables, there are numerous financial and research ranking relationships between the ownership of hospitals and medical schools. However, with regard to ownership/management of the medical school, hospital and practice plan there is no industry standard – "if you have seen one, you have seen one." The key to success is often relationships, governance structures and clearly articulated financial relationships.

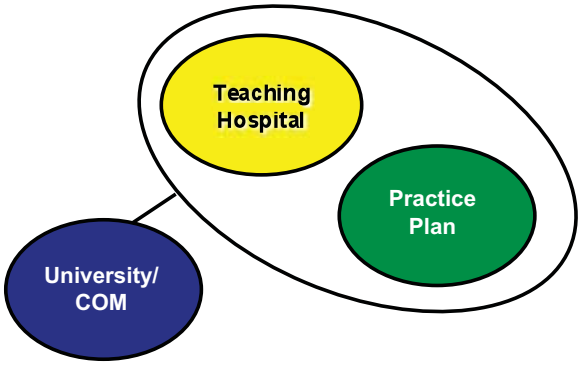
- **Similarities:** Integrated health delivery systems must work together to teach students and graduate trainees, conduct clinical research and provide clinical care to the populations they serve.

- **Differences:** The structure of the relationship between the medical school, teaching hospital and practice plans varies from place to place. There is no standard.

Organization and Governance

The diagram on the left shows an example of the three aspects of the academic health center working together but being operated separately. Examples of this arrangement are Northwestern University Memorial Hospital and Dartmouth-Hitchcock Medical Center. The diagram on the right side shows an example of when the teaching hospital and practice plan are under common governance/ownership but the College of Medicine is owned/governed separately.





Examples:

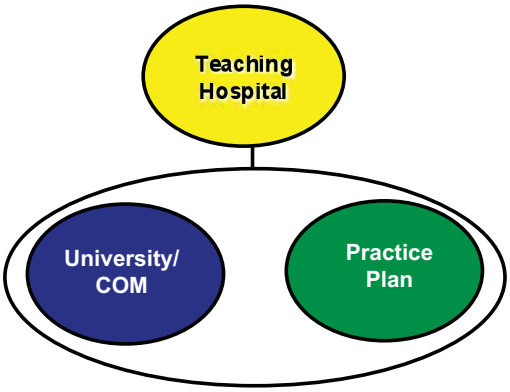
- **Northwestern University Memorial Hospital**
- **Dartmouth-Hitchcock Medical Center**

Examples:

- **Massachusetts General Hospital/Harvard University**
- **New England Medical Center/ Tufts University**

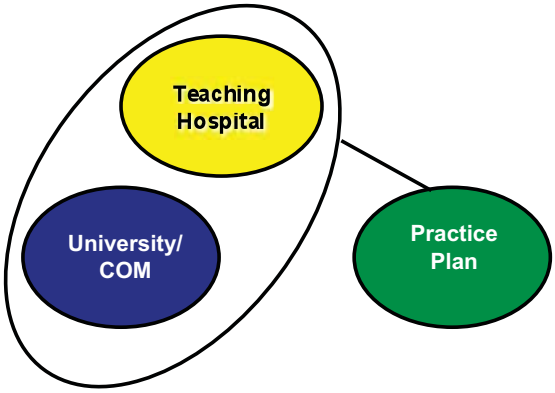
Source: AAMC, Academic Clinical Practice, Summer 2002, Volume 14, No. 2.

Some additional models of ownership are presented below. On the left diagram, the COM and practice plan are under common governance separate from the teaching hospital. The University of Chicago and Columbia University at the time of study utilized this model. When looking at the right diagram, the teaching hospital and the COM are under common governance with the practice plan being governed separately.



Examples:

- **University of Chicago**
- **Columbia University**



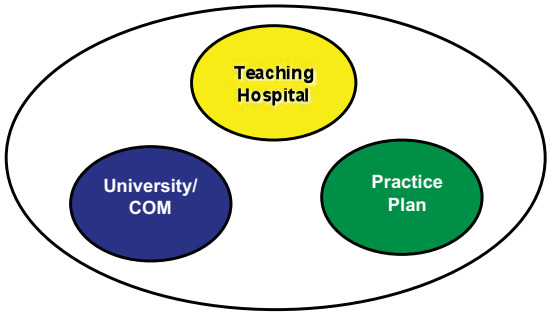
Examples:

- **University of Washington**
- **University of Kentucky**

Source: AAMC, Academic Clinical Practice, Summer 2002, Volume 14, No. 2.

The diagram on the next page shows an academic health center with common ownership/ governance of all three components of the academic health center. University ownership examples include Penn and University of Michigan. This model is also the same model followed by UCHC. The medical school, practice plan and hospital all have common/ownership and governance structures. The Chief Operating Officer of UConn Medical Group (UMG) -- a multi-specialty facility practice, reports to the Chief Medical Officer, who reports the Dean of the School of Medicine. There are approximately 350 faculty who provide some clinical care within UMG. The time that they allocate to those activities varies from 100% to as little as 10%. On an FTE basis, UCHC has roughly 130-135 full-time equivalents. They practice at the main campus in Farmington, in satellite offices in West Hartford, East Hartford, Simsbury, and at a variety of nursing homes and other regional hospitals. UMG experiences approximately 540,000 patient encounters per year. It's management, staff, and faculty are all UCHC employees with the same bargaining units, benefits, etc. as other areas within the Health Center. It is noteworthy that many faculty members of UCHC

are on staff and practice at other regional hospitals while providing education to UConn medical students.



University Ownership Examples:

- **University of Pennsylvania**
- **University of Michigan**

Clinical Ownership Examples:

- **Mayo Clinic**
- **Albany Medical Center**

Source: AAMC, Academic Clinical Practice, Summer 2002, Volume 14, No. 2.

Below is a review of medical schools and their relationships with teaching hospitals[7].

Governance of American Medical Centers	
Privately Owned Medical Schools	
Medical Schools*	**Teaching Hospitals**
Privately Owned Teaching Hospitals, Common Ownership, Head of Hospital Reports to Dean	
Howard	Howard University Hospital
Pennsylvania	Hospital of the University of Pennsylvania
Temple	Temple University Hospital
Privately Owned Teaching Hospitals, Common Ownership, Head of Hospital Does Not Report to Dean	
Albany	Albany Medical Center Hospital
Emory	Emory University and Crawford Long hospitals
Loma Linda	Loma Linda University Medical Center
Pittsburgh	University of Pittsburgh Medical Center
Rochester	Strong Memorial Hospital
Vanderbilt	Vanderbilt University Medical Center
Privately Owned Teaching Hospitals, Common Ownership, Dean Reports to Person or Organization That Owns the Hospital	

[7] Note these relationships are subject to change. Tripp Umbach regularly updates the chart below but changes may occur between study periods.

Mayo	Saint Mary's Hospital, Rochester Methodist Hospital
Rush	Rush-Presbyterian-St. Luke's Medical Center
Privately Owned Teaching Hospitals, Different Ownership	
Albert Einstein	Montefiore Medical Center
Baylor	Methodist Hospital
Boston	Boston Medical Center
Brown	Rhode Island Hospital
Case Western Reserve	University Hospitals of Cleveland
Chicago	University of Chicago Hospitals
Columbia	New York-Presbyterian Hospital
Cornell	New York-Presbyterian Hospital
Creighton	St. Joseph Hospital (for-profit)
Dartmouth	Mary Hitchcock Memorial Hospital
Duke	Duke University Hospital
George Washington	George Washington University Hospital (for-profit)
Georgetown	Georgetown University Hospital
Harvard	Massachusetts General Hospital and others
Jefferson	Thomas Jefferson University Hospital
Johns Hopkins	Johns Hopkins Hospital
Loyola	Loyola University Medical Center
Drexel University College of Medicine	MCP Hospital (for-profit)
Mercer	Medical Center of Central Georgia, Macon Memorial Health University Medical Center, Savannah
Mount Sinai	Mount Sinai Hospital
Northwestern	Northwestern Memorial Hospital
Penn State	Milton S. Hershey Medical Center
St. Louis	St. Louis University Hospital (for profit)
Stanford University	Stanford University Hospital
Tufts	New England Medical Center, Inc.
Tulane	Tulane University Hospital and Clinic (for profit)
Wake Forest	North Carolina Baptist Hospitals, Inc.
Washington, St. Louis	Barnes-Jewish Hospital
Medical College of Wisconsin	Froedtert Memorial Lutheran Hospital
Yale	Yale-New Haven Hospital
Government Owned Teaching Hospitals	
Chicago Medical	Cook County Hospital (County)
Emory	Grady Memorial Hospital (County)
Meharry	Metropolitan Nashville General Hospital (County)
Miami	Jackson Memorial Hospital (County)

Morehouse	Grady Memorial Hospital (County)
New York	Bellevue Hospital (City)
New York Medical College	Westchester Medical Center (County)
Southern California	Los Angeles County USC Medical Center (County)
Tulane	Medical Center of Louisiana at New Orleans (State)
Government-Owned Medical Schools	
Government-Owned Teaching Hospitals, Common Ownership, Head of Hospital Reports to Dean	
Connecticut	John Dempsey Hospital, University of Connecticut Health Center
Iowa	University of Iowa Hospital & Clinics
Louisiana State University, Shreveport	Louisiana State University Hospital
New Jersey, Newark	University Hospital
Mississippi	University Hospitals and Clinics University of Mississippi Medical Center
North Carolina	University of North Carolina Hospitals
Ohio State	Ohio State University Hospitals
South Alabama	University of South Alabama Medical Center
Los Angeles, California	University of California, Los Angeles Medical Center
San Diego, California	University of California, San Diego Medical Center
Utah	University of Utah Hospital
Washington, Seattle	University of Washington Medical Center
Government-Owned Teaching Hospitals, Common Ownership, Head of Hospital Does Not Report to Dean	
Alabama at Birmingham	University of Alabama Hospitals
Arkansas	University Hospitals of Arkansas
Brooklyn, SUNY	University Hospital of Brooklyn
Davis, California	University of California, Davis Medical Center
Irvine, California	University of California, Irvine Medical Center
Illinois	University of Illinois Medical Center at Chicago
Kentucky	University of Kentucky Hospital
Louisiana State University, New Orleans	Medical Center of Louisiana (State)
Louisville	University of Louisville Health Care University Hospital
Michigan	University of Michigan Medical Center
Ohio, Medical College of Toledo	Medical College of Ohio Hospitals
Oregon	Oregon Health Sciences University Hospital
South Carolina, Medical University of	Medical University of South Carolina Medical Center
Stony Brook, SUNY	University Hospital, SUNY, Health Sciences Center, Syracuse
Texas, Galveston	University of Texas Medical Branch Hospital

San Francisco, California	University of California, San Francisco Medical Center
Uniform Services, USUHS	Walter Reed Army Medical Center, National Naval Medical Center
Virginia	University of Virginia Health System
Teaching Hospitals Owned by Governments Different from Medical School	
Colorado	University of Colorado Hospital (State Authority)
East Carolina	Pitt County Memorial Hospital (County)
Kansas	Kansas University Hospital (State)
New Jersey, Robert Wood Johnson	Robert Wood Johnson University Hospital
Missouri, Columbia	University of Missouri Hospital and Clinics (State)
Nevada	University Medical Center, Las Vegas (County)
New Mexico	University of New Mexico Hospital (State)
Texas, San Antonio	University Health System (State)
Texas, Southwestern, Dallas	Parkland Health & Hospitals System
Medical College of Virginia	Medical College of Virginia Hospitals (Hospital District)
Washington, Seattle	Harborview Medical Center (County)
Privately Owned Teaching Hospitals	
Arizona	University Medical Center
Buffalo, SUNY	Buffalo General Hospital System
Cincinnati	University Hospital
East Tennessee	Community Hospital Groups
Eastern Virginia	Sentara Norfolk General Hospital
Florida	Shands Hospital
Hawaii	Queen's Medical Center
Illinois, Southern	Community Hospitals
Indiana	Clarian Health Systems
Marshall	Community Hospitals
Maryland	University of Maryland Medical Center
Massachusetts	UMass Memorial Medical Center
Michigan State	Community Hospitals
Minnesota, Duluth	Community Hospitals
Minnesota	Fairview-University Medical Center
Missouri, Kansas City	Truman Medical Center Hospital Hill
Nebraska	Nebraska Health System
Nevada	Community Hospitals
North Dakota	Community Hospitals
Ohio, Northeastern, Rootstown	Community Hospitals

Oklahoma	University Health Partners (for-profit)
South Carolina	Palmetto Richland Memorial Hospital
South Dakota	Community Hospitals
South Florida	Tampa General Hospital
Tennessee	Regional Medical Center at Memphis
Texas A&M	Scott & White Memorial Hospital
Texas Tech	Community Hospitals
Texas, Houston	Memorial Herman Hospital
Vermont	Fletcher Allen Healthcare
Wayne State	Detroit Medical Center
West Virginia	West Virginia University Hospitals
Wisconsin	University of Wisconsin Hospital and Clinics
Wright State	Miami Valley Hospital

* Source: AAMC 2002, Tripp Umbach Research and John A. Kastor, "Governance of Teaching Hospitals: Turmoil at Penn and Hopkins", 2004.

Key findings from previous Tripp Umbach research show that regardless of ownership or governance structure, it is critical to develop strong relationships and structures that work for each individual academic health center.

- Leaders of the top American schools of medicine and hospitals favor different structures, it is often the structure under which they work or are most familiar.
- Regardless of the governance and leadership structure, an integrated health delivery system must meet its inherent responsibilities to teach, advance medical knowledge, and provide exemplary clinical care.
- Research suggests that success depends largely upon the character and ability of its faculty and its leaders rather than on the structure under which they are governed.

"There isn't an ideal governance model. It's locally defined and impacted by whoever fills the roles." -- (Philip A. Pizzo, MD, Stanford)

The issues of governance and organization are critical for medical schools when forming strategic partnerships and affiliations with clinical partners. The key components to consider when changing the current structures of an existing academic health center parallel many of the same discussions that need to occur when beginning a new medical school, specifically governance, faculty, and finances.

If the University of Connecticut Health Center is no longer in direct control of its teaching hospital, negotiations about the structure of the relationship will be extremely important. The type and level of interaction between the medical school, the hospital and the practice plan will be essential to building a stronger academic health center. The difficulty of forming a strong bond with a clinical affiliate is not to be underestimated. Relationships and trust are key components to building success. Guarantees will need to be made to preserve the integrity of academic medical education. Some issues to consider/best practices which are key to building successful relationships with clinical affiliates are as follows:

Governance

a) Legal form for relationship between University and Clinical Affiliate(s)

b) Potential joint venture issues related to governance need to be considered, such as:
   - i. Decision-making structures between the COM and clinical partner(s) and faculty practice(s)
   - ii. Responsibilities and authority for specific actions and decisions
   - iii. Physician relationships and responsibilities
   - iv. Financial obligations and funding arrangements
   - v. Board appointments
   - vi. Strategic planning
   - vii. Liability and insurance
   - viii. Leases and facilities
   - ix. Dispute resolution

Faculty Relationships

a) Terms of clinical affiliation and practice plan arrangements (services, compensation, billing and collections, scope of clinical education oversight, student assessment obligations, credentialing requirements, medical education, residency training and fellowship programs)

b) Faculty appointment and requirements (core faculty, associate faculty, adjunct faculty and community physicians)

c) Organizational structure (departments and relationships to UConn academic program leadership and reporting relationships)

d) Relationship to residency training and fellowship programs; resident involvement in student training

e) Qualifications under federal and state laws (state provisions for teaching, federal program (Medicare/Medicaid) participation)

Key Findings from Stakeholder Interviews

Names of potential interviewees were provided to Tripp Umbach by the regional hospitals and the UCHC. An interview guide was developed collaboratively between Tripp Umbach and members of the Connecticut Academy of Science and Engineering's project Study Committee. The interview guide was distributed in advance of the meeting and discussions were conducted by Tripp Umbach.

Interviews were scheduled and completed via telephone or in-person with 54 individuals. Leadership at all hospitals were contacted including (in alphabetical order): Bristol Hospital, Charlotte Hungerford Hospital, The Hospital of Central Connecticut, Hartford Hospital, Middlesex Hospital, St. Francis Hospital and University of Connecticut Health Center. Each interview lasted between 30-65 minutes. Participants in the interview process included: clinical faculty from the regional hospitals and UCHC, key leadership at the regional hospitals and at UCHC. The interviews covered three main topic areas: 1) Proposed expansion of John Dempsey Hospital; 2) Relationships with UCHC and/or Regional Hospitals; and 3) Academic Medical Education in the state of Connecticut. The summary of the interviews is presented below.

Key Finding 1: Market Share, Bed Needs and Financial Viability

From a Regional Hospital Perspective

- In nearly all interviews, the issue of market share, financial issues and payor mix were raised by respondents. The Greater Hartford and state of Connecticut markets are small with limited population size and slow population growth. Patients, especially those with health insurance, are a commodity. It was the contention of many regional hospital leaders and clinical faculty that any expansion of John Dempsey Hospital would negatively impact their bottom line and potentially cause their facility to close because of market share shift.
- It was stated by many respondents that Connecticut is over-bedded and does not need to add additional beds to meet the health needs of its residents. Many felt that the expansion of John Dempsey Hospital by 120 beds would just further overcrowd the market, cause a significant market share shift and not bring any real efficiencies to healthcare in the area. With profit margins so tight and the financial stability of many regional hospitals at risk, growing John Dempsey would exacerbate the problems and issues. Respondents stated that there were better and more efficient ways for UConn to meet their needs for medical education without spending $500 million on an expansion project

- It was clearly stated by many regional hospital leaders that the patient population served by the regional hospitals value the regional hospitals presence in the local community setting and that financial constraints imposed upon them by John Dempsey's expansion would cause significant community outcry.

- Numerous respondents also felt that the proposed expansion of John Dempsey Hospital was also giving UConn an unfair advantage in the already tight market place. The issue was frequently raised that the continued funding, "bail out", and support of the health center enterprise by the state was a waste of taxpayer dollars and gave UCHC unfair advantage.

- Questions from respondents about the proposed expansion of John Dempsey Hospital centered around the following key issues: 1) Is this a good use of tax payer dollars?; 2) How will the health center be held accountable for the financial viability of the endeavor?; and 3) How will this really benefit medical education?

From UCHC's perspective

- According to leadership at UConn, it is mission critical to address the clinical component of medical education at UConn. The John Dempsey Hospital is not a state of the art facility and does not have enough beds to support medical education or research thereby hindering the fulfillment of the mission of the school of medicine to the state of Connecticut and their residents.

- UConn respondents stated that their limited hospital size, in conjunction with their encumbered bed numbers (NICU, psychiatric beds and prison floor), have not allowed them to advance clinically and increase their financial independence with only 108 medical surgical beds to see patients and fulfill their academic mission. There are three legs on the stool in academic medicine: education, research and clinical care. Without working on all three aspects of academic medicine, the school will not rise up in the ranks and will become increasingly unable to recruit top-level students, faculty and research.

Key Finding 2: Relationships Between Regional Hospitals and UCHC

- There is strong evidence of collaboration and partnership between the regional hospitals and the University of Connecticut Health Center. In nearly all interviews with the regional hospitals and the University of Connecticut, examples of joint facility and academic appointments, cooperation on medical education of students and residents, and joint recruiting of top-notch clinical faculty were shared. Regional hospitals and the

University of Connecticut collaborate frequently to meet the educational needs of the school of medicine.

- However, relationship issues do exist between the regional hospitals and the University of Connecticut School of Medicine. There has been a long history of competition, political wrangling and in-fighting both between the regional hospitals and the regional hospitals and UConn. Since the University of Connecticut Health Center was built out in Farmington, its role as the safety-net hospital has been questioned along with its level of state financial support.

- Corporate (organizational) culture issues abound between the regional hospitals and the University of Connecticut Health Center which cause misunderstandings and mistrust between the parties involved. The regional hospitals and some staff perceive an academic "arrogance" from the University of Connecticut as well as an inability to move quickly to make decisions and partner with their institutions. At the University of Connecticut Health Center, many feel that the mission of the academic health center is not valued or completely understood by some at the regional hospitals, thereby weakening collegial relationships between the institutions. While these issues are not unique to the Connecticut market, they are further exacerbated by the size of the market and personal relationships between leaders at all levels within the institutions.

Key Finding 3: In Support of Academic Medical Education

- While there is much disagreement on how UConn should move forward with their plans to grow and advance medical education in the state of Connecticut, all parties agreed that it is critical to support medical education in the state. When specifically asked if the state should continue to have and support medical education, the response was unequivocally "yes," but it was unclear from the interviews how much state support should be given and what level of financial support should come from the state.

- Discussions about how the school could function in an even more distributed model were held with respondents from the regional hospitals. Leaders at the larger hospitals felt that they could continue to grow their financial and administrative support of UCHC's medical education mission at all three levels -- education, research and clinical care.

- From the perspective of UCHC, there is clear acknowledgment of the support it receives from its clinical partners in educating medical students and residents throughout the region. There is no doubt that they are not "going it alone" in their educational endeavor and the collaboration between regional partners has been invaluable.

- With regard to partnerships and different medical school models to enhance UCHC, there were varied opinions (both positive and negative) about pursuing a more distributed model than currently exists. Many interviewed at UCHC, especially those involved in research, felt that the strength of having research space, clinical space and education co-located was invaluable to providing synergy for scientific and clinical discovery; thereby favoring an integrated approach to academic medicine.

Key Finding 4: Medicaid Reimbursement, CON and State Health Plan

- Issues were raised by the regional hospitals about the disparities in Medicaid reimbursement between their facilities and UCHC. In addition, it was stated by many that the absence of a statewide health plan and the current structure of the CON process in the absence of a state plan creates an even more politically charged healthcare environment for all entities. It was clear that there is a great deal of misunderstanding about how Medicaid reimbursement rates are set as well as why the supposed disparities exist.

Key Finding 5: Better Defining UCHC's Role

- Throughout the interviews, it became apparent that there is not a solid understanding of UConn's role as the state medical school within the community and among the regional hospitals. Tripp Umbach believes that this is a great opportunity for the regional hospitals and UCHC to further build relationships and partnerships. Strategically for UCHC, it is critical that the broader healthcare community and residents of the State understand the value that academic medicine can bring to the region. UCHC needs to work to communicate and continue to assert its role as the state's academic health center.

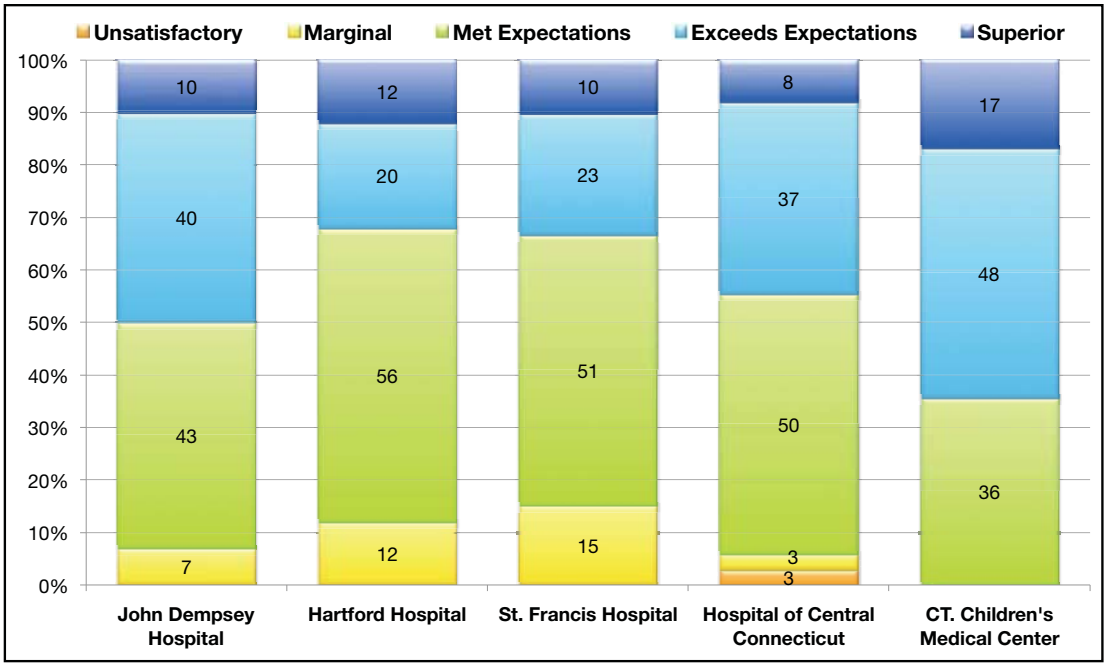
Based on all the interviews, it is clear that the discussion of building a replacement hospital and its impact on market share and patient volumes needs to be addressed but should not be the primary focus of any decision regarding academic medicine in the state of Connecticut. It is Tripp Umbach's opinion that the discussion must be elevated to a broader and more visionary level regarding how to best support and enhance medical education in the state, so that yet another opportunity will not be lost.

Key Findings from University of Connecticut Medical Student Survey

An online survey was developed in cooperation with the University of Connecticut School of Medicine, CASE Study Committee and Tripp Umbach. The survey was distributed to all 4th year medical students for completion over a 1 week time period in January 2008. A total of 43 surveys were analyzed for the purposes of this report. A full summary of results is presented in Appendix A of this report.

The goal of the survey was to gather information about the educational and learning experience at John Dempsey Hospital, Hartford Hospital, St. Francis Hospital, the Hospital of Central Connecticut and Connecticut Children's Medical Center. Question by question there are variances in overall response but it is clear that all regional hospitals are providing quality educational experiences. John Dempsey Hospital performs consistently at parity or above the other regional players.

Overall results show that John Dempsey Hospital rates very highly in comparison to the other regional hospitals with 50% of students reporting that the overall learning environment "Exceeds Expectations" or is "Superior". CCMC received the top score of 65%. The other regional hospitals performed quite well in this category as well.



State of CT, Greater Hartford and John Dempsey Hospital PSA Bed Analysis Study

Executive Summary

Tripp Umbach completed a comprehensive bed study for the state of Connecticut, Greater Hartford Area and John Dempsey Hospital Primary Service Area. Tripp Umbach sought to examine current staffed beds[8] as compared to licensed beds[9] in the above three geographies and project potential growth in the market out to 2030 by 5 year intervals.

The table below shows the total number of licensed and staffed beds by market and hospital.

Market	Licensed Beds	Staffed Beds
Connecticut	9256	7231
JDH PSA	2289	2022
Greater Hartford Area	2289	2022
Hospital	**Licensed Beds**	**Staffed Beds**
Bristol Hospital	154	154
John Dempsey Hospital	224	224
Hartford Hospital	867	749
The Hospital of Central Connecticut	362	321
Saint Francis Hospital	682	574

SOURCE: Annual Report Fiscal Year 2006 State of Connecticut Office of Health Care Access , October 2007

[8] Staffed Beds: Beds that are licensed and physically available for which staff is on hand to attend to the patient who occupies the bed. Staffed beds include those that are occupied and those that are vacant.

[9] Licensed Beds: The maximum number of beds for which a hospital holds a license to operate. Many hospitals do not operate all of the beds for which they are licensed.

To accomplish this task, Tripp Umbach utilized a market standard CON methodology[10] based upon establishing historical, current and projected data[11] in the following categories:

- Population and demographic growth rates.
- Inpatient utilization trends per 1,000 population.
- Average length of stay.
- Patient Days.
- Target occupancy rate of 80%.

Projecting future bed requirements required Tripp Umbach to develop numerous assumptions and scenarios to quantify how many beds will be required to effectively serve the state, region and JDH PSA. Based upon previous studies completed for other CON states, Tripp Umbach believes that the most likely scenario for bed requirements is based upon actual 2005 US reported inpatient utilization rates remaining flat to 2030 for 4 age demographic groups. This scenario looks at utilization rates broken out by: 0-17 years of age, 18-44 years of age, 45 - 64 years of age and 65 and older. Given the conservative 2005 US average utilization rates, this scenario reflects the significant shift in the demographic makeup of the population in the respective age groups, most notably the dramatic growth in the population aged 65 and older. Tripp Umbach would like to emphasize that these projections are based upon current healthcare trends and, considering the volatility of the healthcare industry as a whole, should be continually evaluated and monitored based upon industry shifts and trends.

Of equal or possibly greater significance is the tremendous growth in the 65+ population and the implications for the healthcare system in Connecticut. As shown, this segment of the population has the highest utilization of inpatient healthcare services and providers must prepare for the demands this group places on physicians, clinical staff, and technology.

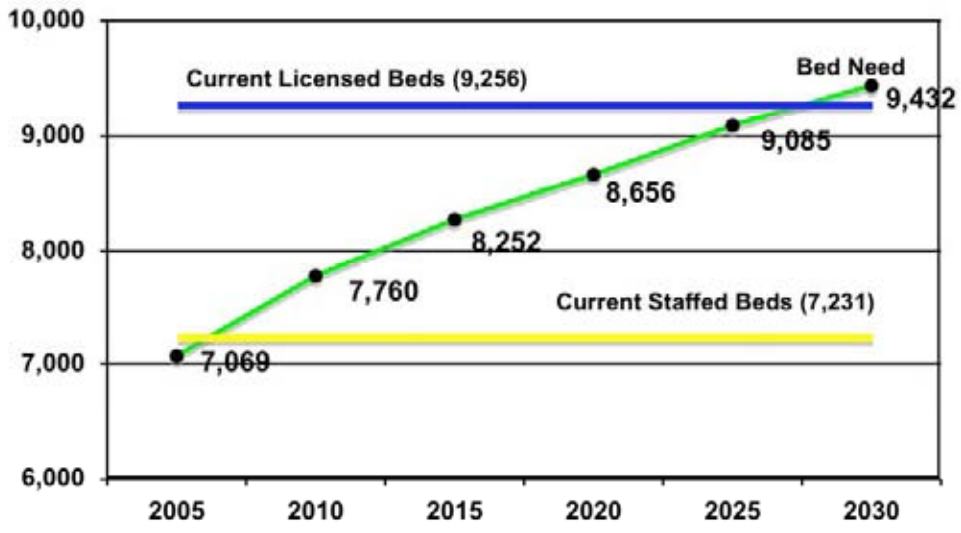
[10] It is critical to note that there is no standard methodology to complete CON bed analysis throughout the United States, rather there are many acceptable methodologies.

[11] Data was obtained from numerous sources including the US Census, Solucient, and Connecticut Office of Health Care Access.

State of Connecticut

It appears that additional staffed beds are required throughout the state of Connecticut at this time. However, additional licensed beds may not be necessary in the state of Connecticut until between 2025 to 2030.

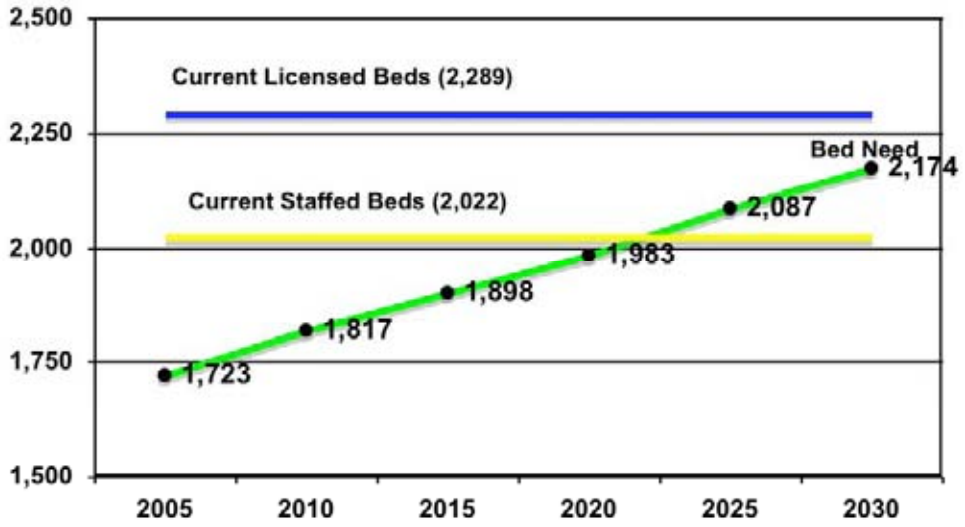
State of Connecticut Bed Analysis
2005 - 2030



JDH PSA Bed Analysis

In the JDH PSA, additional staffed beds should not be necessary until between 2020 and 2025 at the earliest. Moreover, based upon projections, additional licensed beds are not needed through 2030.

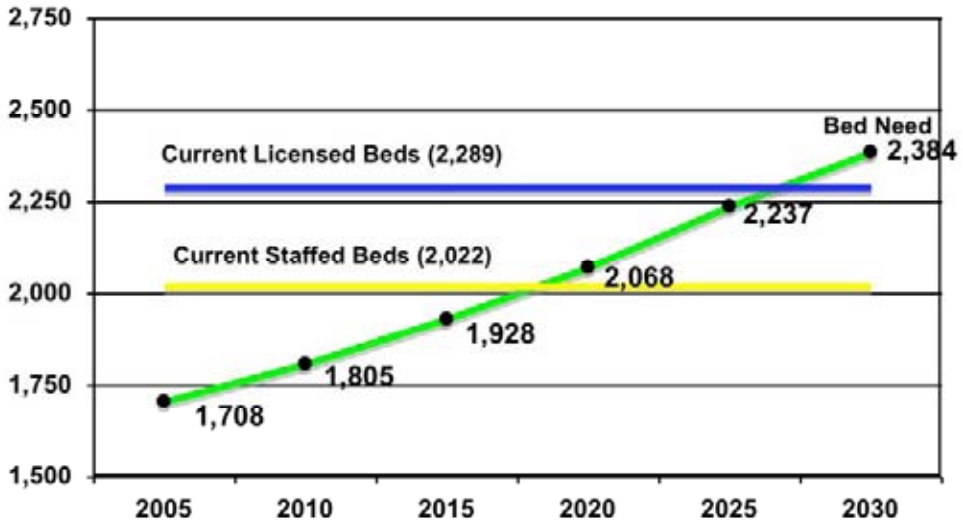
JDH PSA Bed Analysis
2005 – 2030



Greater Hartford Area Bed Analysis

By 2015, additional staffed beds should be brought online at the hospitals in the Greater Hartford Area to accommodate projected need. Newly licensed beds may be necessary in the area between 2020 and 2025 in order to meet patient demands.

Greater Hartford Area Bed Analysis
2005 – 2030



State of Connecticut, Greater Hartford and John Dempsey Hospital PSA Bed Analysis Study (2005-2030)

Introduction and Overview

In an effort to facilitate dialogue and planning initiatives in preparation of patient care services, Tripp Umbach prepared the following bed analysis for the state of Connecticut, John Dempsey Hospital Primary Service Area (JDH PSA)[12], and the Greater Hartford Area[13]. Tripp Umbach sought to examine current staffed beds[14] as compared to licensed beds[15] in the above three geographies and project potential growth in the market out to 2030 by 5-year intervals. The following table represents the current inventory of licensed and staffed beds by market and hospital:

Market	Licensed Beds	Staffed Beds
Connecticut	9256	7231
JDH PSA	2289	2022
Greater Hartford Area	2289	2022
Hospital	**Licensed Beds**	**Staffed Beds**
Bristol Hospital	154	154
John Dempsey Hospital	224	224
Hartford Hospital	867	749
The Hospital of Central Connecticut	362	321
Saint Francis Hospital	682	574

SOURCE: Annual Report Fiscal Year 2006 State of Connecticut Office of Health Care Access , October 2007

These hospitals comprise the number of acute care hospital beds in the JDH PSA and Greater Hartford Area.

[12] The John Dempsey Primary Service area includes the following towns: Avon, Burlington, East Hartford, Granby, New Britain, Simsbury, Bloomfield, Canton, Farmington, Hartford, Newington and West Hartford.

[13] Greater Hartford includes the following towns: Andover, Avon, Berlin, Bloomfield, Bolton, Burlington, Canton, Coventry, Cromwell, East Granby, East Hartford, East Windsor, Ellington, Enfield, Farmington, Glastonbury, Granby, Hartford, Hebron, Manchester, Mansfield, Marlborough, New Britain, Newington, Rocky Hill, Simsbury, Somers, South Windsor, Stafford, Suffield, Tolland, Vernon, West Hartford Wethersfield, Windsor, and Windsor Locks.

[14] Staffed Beds: Beds that are licensed and physically available for which staff is on hand to attend to the patient who occupies the bed. Staffed beds include those that are occupied and those that are vacant.

[15] Licensed Beds: The maximum number of beds for which a hospital holds a license to operate. Many hospitals do not operate all of the beds for which they are licensed.

The objective of the bed analysis segment of this report is to assess current inpatient utilization and project the need for both licensed and staffed beds within three specific geographies. The analysis and projections in this report are primarily based upon establishing historical, current and projected:

- Population and demographic growth rates.
- Inpatient utilization trends per 1,000 population.
- Average length of stay.
- Patient Days.
- Target occupancy rate of 80%.

Overview of Scenarios

In order to complete this analysis, numerous assumptions and scenarios were developed. Based on Tripp Umbach's experience in completing bed analysis, the following scenarios are market standard and will offer a range of potential for each of the geographies being examined. For all scenarios, the basis for the projections is inpatient utilization trends applied to population estimates out to the year 2030. The three different scenarios used for projecting inpatient utilization trends are defined and presented in summary form below:

Scenario 1. Inpatient utilization rates remain flat to 2030. Scenario 1 is based upon actual 2005 overall inpatient utilization rates as reported by the hospitals in their respective markets.

Scenario 2. Inpatient utilization rates remain flat to 2030 for 4 age demographic groups. Scenario 2 is based upon actual US reported utilization rates by age category in 2005.

Scenario 3. Inpatient utilization rates to 2030 for 4 age demographic groups mirrors the US reported change in rates by age category from 1980 – 2005.

Based upon experience, Tripp Umbach believes that the likely bed scenario to be realized in geographies studied will be Scenario 2.

Bed Analysis Data and Findings

To complete the bed analysis there are three areas that needed to be analyzed before determining bed requirements for the state of Connecticut, JDH PSA and Greater Hartford Region. Specifically they are: 1) population, 2) discharge data, 3) utilization trends.

Step 1: Analysis of Population Trends By Geography

Connecticut

- The estimated 73.6% growth in the population age 65 and older will significantly impact the demand for health services.
- The overall projected state population growth is 6.9% from 2005 to 2030.
- While the growth rate for children is statistically flat, both the 18-44 and 45-64 demographics are expected to decline 5.7% and 4.5% respectively.

All Ages	2005	2010	2015	2020	2025	2030
0 - 17	836,096	822,892	814,267	819,173	834,683	836,230
18 - 44	1,277,834	1,240,070	1,234,463	1,242,551	1,230,131	1,205,075
45 - 64	924,109	1,044,757	1,063,188	1,016,041	935,776	882,712
65 +	483,472	538,316	608,344	681,612	769,132	839,271
	3,521,511	3,646,035	3,720,262	3,759,377	3,769,722	3,763,288

Source: Solucient 2007, UCHC Bed Need Study

JDH Primary Service Area

- The overall projected population growth rate of 4.2% in the JDH PSA by the year 2030 fails to reflect the underlying shift in demographics by age.
- The 62.9% estimated growth in the 65 and older population mirrors the significant growth projected in the entire state for the same population.
- All other age demographics are expected to decline in population by between 2% and 8.7%

All Ages	2005	2010	2015	2020	2025	2030
0 - 17	111,743	108,810	106,924	107,441	109,442	109,505
18 - 44	166,388	162,563	161,765	162,397	160,484	157,153
45 - 64	110,374	121,596	121,811	116,281	107,216	100,767
65 +	64,685	69,561	76,267	84,678	95,583	104,777
	453,190	462,530	466,767	470,797	472,725	472,202

Source: Solucient 2007, UCHC Bed Need Study

Greater Hartford Area

- This market area represents the highest projected population growth rate to 2030 with an expected 11% increase in the overall population.
- The 65 and older population is expected to increase by 92% resulting in an additional 106,361 citizens in this demographic by 2030.
- The only significant decrease in population is projected in the 45 – 64 age demographic, which is expected to experience a 15% decline.

All Ages	2005	2010	2015	2020	2025	2030
0 - 17	176,888	173,468	174,616	176,410	177,316	177,380
18 - 44	330,954	321,921	320,169	327,962	343,553	353,496
45 - 64	231,707	253,020	253,727	239,679	212,907	196,277
65 +	115,323	125,146	143,403	166,723	196,792	221,684
	854,872	873,555	891,915	910,774	930,568	948,837

Rodriguez, Orlando, 2007. Killingly, CT Population Projection from 2010 to 2030 by Age, Ethnicity and Sex Distributions, Connecticut State Data Center, University of Connecticut, Storrs, Connecticut.

Step 2: Overview of Utilization Trends

Discharges for the past three years in Connecticut and from the JDH PSA have remained steady growing annually by 0.01% in the state and 2.5% annually in the hospital service area.

	2004	2005	2006
Connecticut	381,093	384,316	386,334
JDH PSA	50,740	52,023	53,312
Greater Hartford	100,873	103,593	104,741

Source: Annual Report FY 2006, Office of Health Care Access
Connecticut Hospital Association Patient Census Report FY04 – FY06

Applying 2005 population estimates to the 2005 reported discharges results in an estimated overall discharge rate per 1,000 of:

	2005
Connecticut	109.1
JDH PSA	114.8
Greater Hartford	121.2
Comparative overall discharge rates per 1,000	

	2005
United States*	117.4
Northeast Region*	131.8

*Source: 2005 National Hospital Discharge Survey, National Center for Health Statistics, July 12, 2007

- The estimated overall discharge rate per 1,000 in the state of Connecticut, the JDH PSA, and the Greater Hartford area in 2005 appear consistent and within the National Center for Health Statistics estimated US rates but considerably lower than estimated Northeast regional rates.

Step 3: Overview of Utilization Rates by Demographic Age Groups

While overall population growth rates in Connecticut and the JDH PSA to the year 2030 are modest, the Greater Hartford area is expecting approximately 90,000 additional residents. As illustrated below in the following tables, however, significant shifts are anticipated within the demographic age makeup of each population.

Discharge Rates per 1,000 vary dramatically based upon demographic age groups as shown in the following table:

Discharge Rates per 1,000 Population
United States

	1970	1980	1985	1990	1995	2000	2005
All Ages	144.3	167.7	148.4	122.3	115.7	112.8	117.4
0 - 14	66.8	71.6	57.7	43.1	40.4	39.5	40.1
15 - 44	154.6	150.1	125	99.3	87.8	80.9	85.3
45 - 64	159.6	194.8	170.8	135.5	118.5	111.4	114.7
65 +	293.3	383.7	369.8	334.1	347.7	353.4	359.6

Source: 2004 & 2005 National Hospital Discharge Survey, National Center for Health Statistics
Oct 2006 & July 2007

2004 Discharge rates as reported in the Northeast Region are significantly higher than the overall US rates:

2004 Discharge Rates per 1,000 Population
US and Northeast Region

	0 - 14	15 - 44	45 -64	65 +
US	42.3	86.6	117.8	362.9
Northeast	46.8	89.9	128.6	414.9

Source: 2004 National Hospital Discharge Survey, National Center for Health Statistics
October 2006

- Over the last decade, discharge rates per 1,000 in the United States appear relatively constant overall and in each demographic age group with the exception of the 65 and older population, which appears to be trending upward.

- Northeast regional discharge rates in all age categories are consistently higher than the reported rates in the United States. Using the US rates as a baseline in this report will provide a conservative estimate.

Discharge Projections

Scenario 1

Key assumptions made in this scenario are that discharge rates remain flat based upon 2005 discharges per 1,000 population: For Connecticut the rate is 109.1, JDH PSA the rate is 114.8 and Greater Hartford Area the rate is 121.2.

Connecticut
Discharge Projections

Scenario 1	2005	2010	2015	2020	2025	2030
State	384,197	397,782	405,881	410,148	411,277	410,575

JDH PSA
Discharge Projections

Scenario 1	2005	2010	2015	2020	2025	2030
JDH PSA	52,026	53,098	53,585	54,047	54,269	54,209

Greater Hartford Area
Discharge Projections

Scenario 1	2005	2010	2015	2020	2025	2030
Grt Hartford	103,610	105,875	108,100	110,386	112,785	114,999

When analyzing the data, it is clear that the estimated growth in discharges of 6.8% in Connecticut, 4.2% in the JDH PSA, and 11% in the Greater Hartford area from 2005 to 2030 is consistent with the projected population growth in each area.

Scenario 2

Key assumptions in data analysis utilizing Scenario 2 are that the projected discharge rates per 1,000 population by age categories are based upon US reported age related discharges per 1,000 in 2005.

Connecticut
Discharge Projections

Scenario 2	2005	2010	2015	2020	2025	2030
0 - 14	28,163	26,765	26,839	28,005	28,775	28,477
15 - 44	120,410	119,038	117,665	116,292	114,920	113,547
45 - 64	105,995	119,834	121,948	116,540	107,334	101,247
65 +	173,857	193,578	218,761	245,108	276,580	301,802
Total	428,425	459,214	485,212	505,945	527,608	545,073

JDH PSA
Discharge Projections

Scenario 2	2005	2010	2015	2020	2025	2030
0 - 14	3,884	3,726	3,732	3,891	4,008	3,990
15 - 44	15,463	15,222	14,981	14,740	14,500	14,259
45 - 64	12,660	13,947	13,972	13,337	12,298	11,558
65 +	23,261	25,014	27,426	30,450	34,372	37,678
Total	55,267	57,909	60,110	62,419	65,177	67,484

Greater Hartford Area
Discharge Projections

Scenario 2	2005	2010	2015	2020	2025	2030
0 - 14	7,093	6,956	7,002	7,074	7,110	7,113
15 - 44	28,230	27,460	27,310	27,975	29,305	30,153
45 - 64	26,577	29,021	29,102	27,491	24,420	22,513
65 +	41,470	45,003	51,568	59,954	70,766	79,718
Total	103,371	108,440	114,983	122,494	131,602	139,497

Findings from the analysis of discharges utilizing Scenario 2 show that overall projected discharges increase in the state by 27%, the JDH PSA by 22%, and the Greater Hartford area by 35% from 2005 to 2030. While three of the age categories remain fairly constant in each area, the 65 and older demographic is expected to generate an increase in discharges by 73.6% in the state, 61.9% in the hospital service area, and 91% in the Greater Hartford area.

Scenario 3:

Key assumptions utilized in Scenario 3 are that projected discharge rates per 1,000 population by age categories from 2005 to 2030 mirror the US reported change in discharge rates by age category from 1980 to 2005.

Connecticut
Discharge Projections

Scenario 3	2005	2010	2015	2020	2025	2030
0 - 14	28,163	21,569	16,156	15,802	15,874	15,949
15 - 44	120,410	99,132	77,842	68,024	61,939	64,527
45 - 64	105,995	105,070	84,825	70,893	61,381	59,615
65 +	173,857	186,566	190,482	222,111	254,739	282,846
Total	428,425	412,336	369,305	376,830	393,933	422,937

JDH PSA
Discharge Projections

Scenario 3	2005	2010	2015	2020	2025	2030
0 - 14	3,884	3,003	2,246	2,195	2,211	2,235
15 - 44	15,463	12,677	9,911	8,622	7,815	8,103
45 - 64	12,660	12,229	9,719	8,113	7,033	6,805
65 +	23,261	24,108	23,880	27,593	31,657	35,311
Total	55,267	52,016	45,756	46,524	48,716	52,454

Greater Hartford Area
Discharge Projections

Scenario 3	2005	2010	2015	2020	2025	2030
0 - 14	7,093	5,606	4,215	3,991	3,923	3,984
15 - 44	28,230	22,868	18,067	16,364	15,795	17,136
45 - 64	26,577	25,446	20,243	16,723	13,965	13,256
65 +	41,470	43,372	44,902	54,329	65,178	74,711
Total	103,371	97,292	87,427	91,407	98,861	109,086

The key findings from the analysis of discharges in Scenario 3 show that overall projected discharges remain fairly constant from 2005 to 2030, as a result of population growth estimates offsetting declines in discharge rates over the time period. It is of note that similar to Scenario 2, this scenario illustrates significant changes in discharges based upon age demographic groups.

Tripp Umbach Research Findings

The graphics below illustrate the above findings by geography. Tripp Umbach believes it is critical to focus on the trends shown on the graphics as opposed to focusing on exact numbers in order to plan for the future.

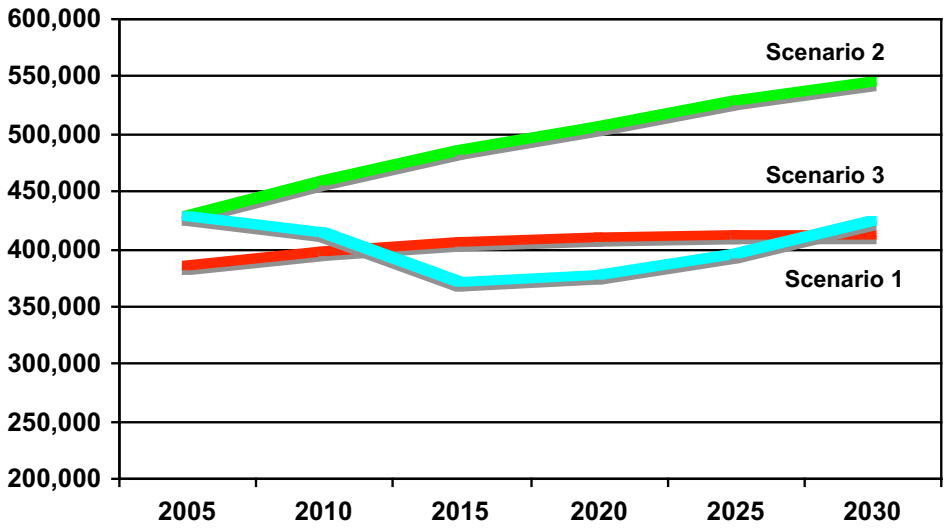
Legend

Scenario 1: Discharge rates remain flat to 2030.

Scenario 2: Discharge rates remain flat to 2030 for 4 age demographic groups.

Scenario 3: Discharge rates to 2030 for 4 age demographic groups mirrors the US reported change in rates by age category from 1980 – 2005.

Connecticut
Estimated Discharges by Scenario 2005-2030



Tripp Umbach Research Findings

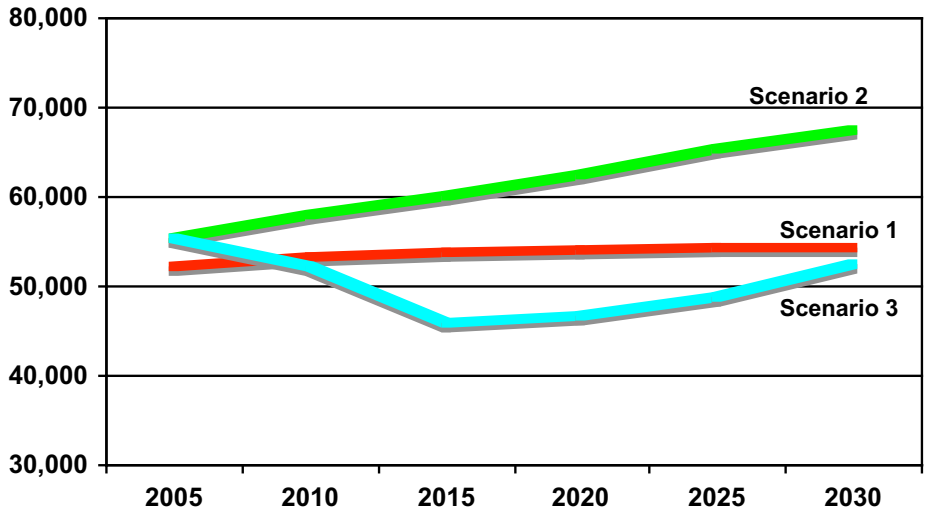
Legend

Scenario 1: Discharge rates remain flat to 2030.

Scenario 2: Discharge rates remain flat to 2030 for 4 age demographic groups.

Scenario 3: Discharge rates to 2030 for 4 age demographic groups mirrors the US reported change in rates by age category from 1980 – 2005.

JDH PSA
Estimated Discharges by Scenario 2005-2030



Tripp Umbach Research Findings

Legend

Scenario 1: Discharge rates remain flat to 2030.

Scenario 2: Discharge rates remain flat to 2030 for 4 age demographic groups.

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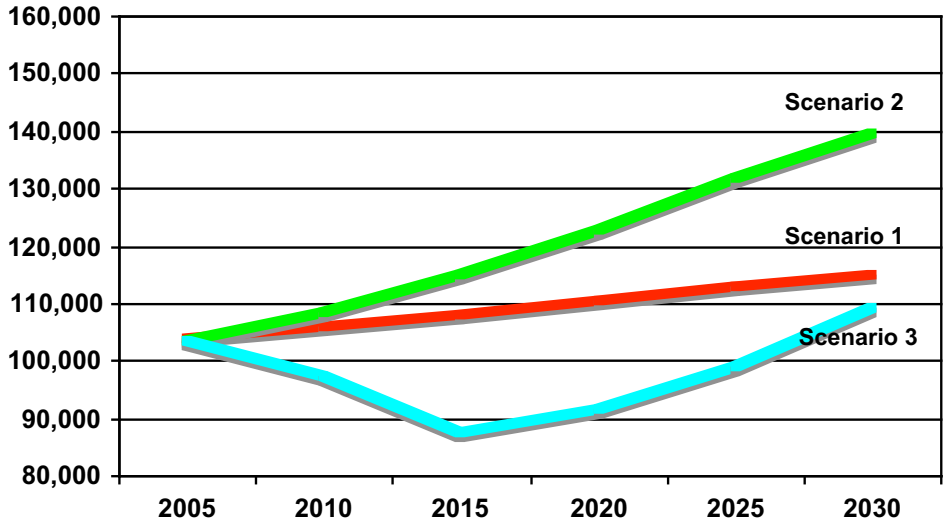
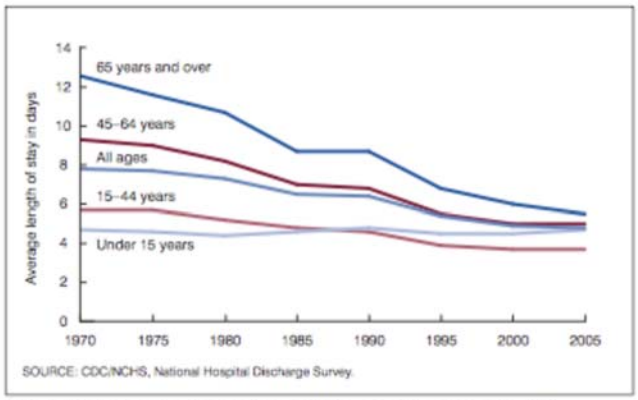
Greater Hartford Area
Estimated Discharges by Scenario 2005-2030



Average Length of Stay

ALOS statistics have changed drastically over the past few decades as reflected in the following graphic. Many factors certainly have affected this including medical advancement, changes in reimbursement, and consumer demand.

Average Length of Stay US 1970 - 2005



Average length of stay in days by age: United States, selected years 1970–2005

Source: CDC/NCHS National Hospital Discharge Survey. October 2007

Utilizing the three scenarios established, projections for total patient days were be developed factoring total discharges with calculated average length of stay (ALOS) estimates based upon the same criteria:

Scenario 1

The projected increase in patient days in this scenario again reflects the projected population growth estimates to 2030 in the three areas respectively.

Assumption – ALOS remains flat based upon 2005 actual Connecticut reported averages. ALOS used: 5.3

Connecticut
Patient Days

Scenario 1	2005	2010	2015	2020	2025	2030
State	2,036,244	2,108,245	2,151,169	2,173,784	2,179,768	2,176,048

Assumption – Utilize 2005 ALOS average for the five area hospitals. ALOS: 5.3

JDH PSA
Patient Days

Scenario 1	2005	2010	2015	2020	2025	2030
JDH PSA	275,739	281,422	284,000	286,452	287,625	287,307

Assumption – Utilize 2005 ALOS average for the five area hospitals. ALOS: 5.3

Greater Hartford Area
Patient Days

Scenario 1	2005	2010	2015	2020	2025	2030
Gtr Hrtfd	549,136	561,137	572,931	585,045	597,760	609,495

Scenario 2

While total projected patient days increase by 33%, 26%, and 40% respectively, estimated patient days for the population 65 and older increases by 74% in the state, 62% in the JDH PSA, and 92% in the Greater Hartford area.

Assumption – Projected ALOS rates flat based upon US reported age related ALOS in 2005.

Connecticut
Patient Days

Scenario 2	2005	2010	2015	2020	2025	2030
0 - 14	132,366	125,793	126,144	131,626	135,241	133,843
15 - 44	445,518	476,150	470,660	465,169	459,679	454,187
45 - 64	529,977	599,168	609,738	582,700	536,668	506,235
65 +	956,211	1,064,681	1,203,183	1,348,092	1,521,189	1,659,910
Total	2,064,072	2,265,793	2,409,725	2,527,587	2,652,776	2,754,176

JDH PSA
Patient Days

Scenario 2	2005	2010	2015	2020	2025	2030
0 - 14	18,254	17,513	17,539	18,287	18,836	18,752
15 - 44	57,213	56,322	55,431	54,540	53,649	52,757
45 - 64	63,299	69,735	69,859	66,687	61,488	57,790
65 +	127,934	137,578	150,841	167,476	189,044	207,228
Total	266,700	281,147	293,669	306,990	323,017	336,527

Greater Hartford Area
Patient Days

Scenario 2	2005	2010	2015	2020	2025	2030
0 - 14	33,338	32,694	32,910	33,248	33,419	33,431
15 - 44	104,452	101,601	101,049	103,508	108,429	111,567
45 - 64	132,884	145,107	145,512	137,456	122,102	112,565
65 +	228,086	247,514	283,622	329,745	389,215	438,447
Total	498,760	526,916	563,093	603,957	653,165	696,009

Scenario 3

Patient days are projected to decrease by 40%, 43%, and 21% respectively in the state, JDH PSA, and the Greater Hartford area in this scenario. ALOS rates for the 65 and older population decreased from 10.7 in 1980 to 5.5 in 2005.

Assumption – ALOS rates by age categories from 2005 to 2030 mirrors the US reported change in ALOS rates by age category from 1980 to 2005.

Connecticut
Patient Days

Scenario 3	2005	2010	2015	2020	2025	2030
0 - 14	132,366	105,980	82,836	75,957	76,305	80,071
15 - 44	445,518	338,574	254,784	188,768	163,066	169,880
45 - 64	529,977	448,468	351,713	237,751	187,136	181,754
65 +	956,211	834,315	851,828	776,350	785,643	799,634
Total	2,064,072	1,727,338	1,541,161	1,278,826	1,212,150	1,231,339

JDH PSA
Patient Days

Scenario 3	2005	2010	2015	2020	2025	2030
0 - 14	18,254	14,754	11,517	10,553	10,628	11,218
15 - 44	57,213	43,295	32,439	23,927	20,574	21,333
45 - 64	63,299	52,196	40,296	27,209	21,441	20,748
65 +	127,934	107,810	106,792	96,448	97,635	99,829
Total	266,700	218,055	191,045	158,137	150,278	153,128

Tripp Umbach Research Findings

Greater Hartford Area
Patient Days

Scenario 3	2005	2010	2015	2020	2025	2030
0 - 14	33,338	27,544	21,611	19,186	18,855	20,000
15 - 44	104,452	93,786	89,389	77,631	77,151	79,384
45 - 64	132,884	123,872	120,669	92,196	74,453	68,637
65 +	228,086	201,250	230,609	209,557	218,252	225,370
Total	498,760	446,451	462,278	398,571	388,711	393,391

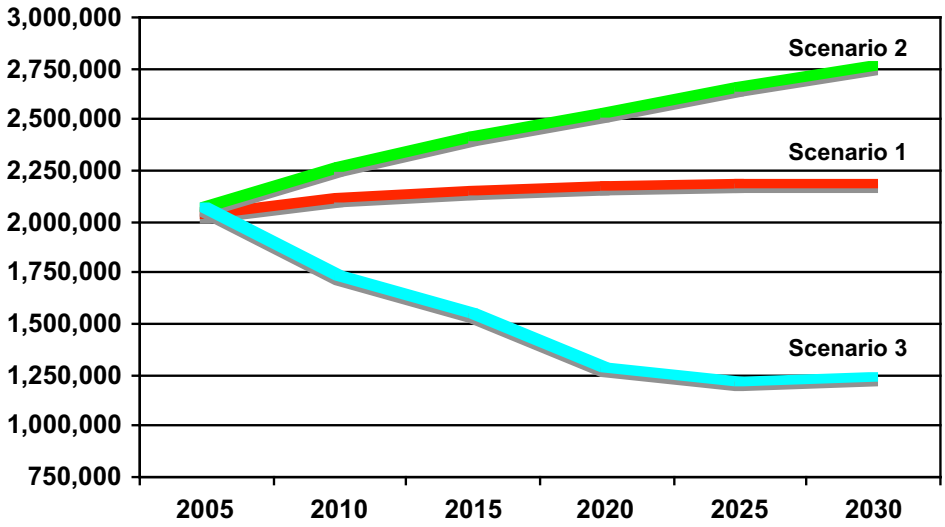
Legend

Scenario 1: Projected ALOS rates remain flat to 2030.

Scenario 2: Projected ALOS rates remain flat to 2030 for 4 age demographic groups.

Scenario 3: Projected ALOS rates to 2030 for 4 age demographic groups mirrors the US reported change in rates by age category from 1980 – 2005.

Connecticut
Patient Days by Scenario 2005-2030



Tripp Umbach Research Findings

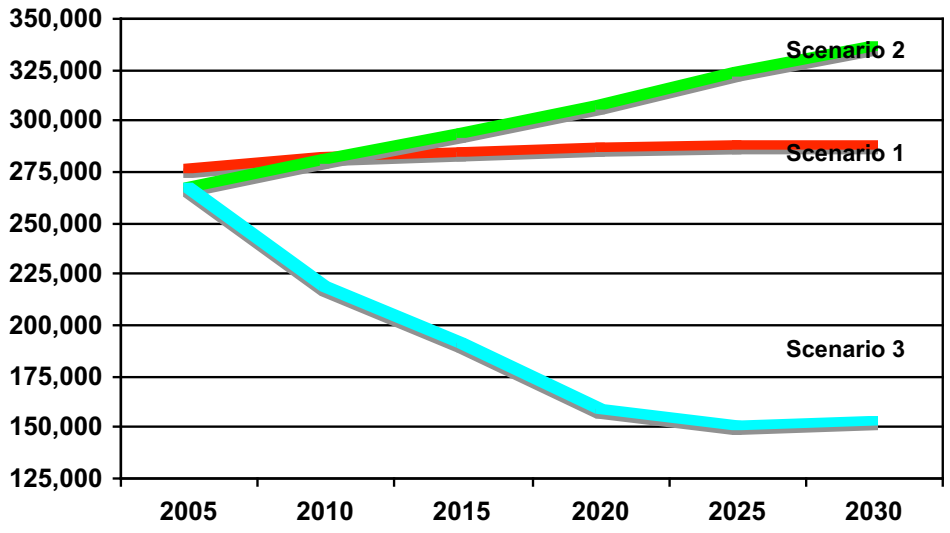
Legend

Scenario 1: Projected ALOS rates remain flat to 2030.

Scenario 2: Projected ALOS rates remain flat to 2030 for 4 age demographic groups.

Scenario 3: Projected ALOS rates to 2030 for 4 age demographic groups mirrors the US reported change in rates by age category from 1980 – 2005.

JDH PSA
Patient Days by Scenario 2005-2030



Tripp Umbach Research Findings

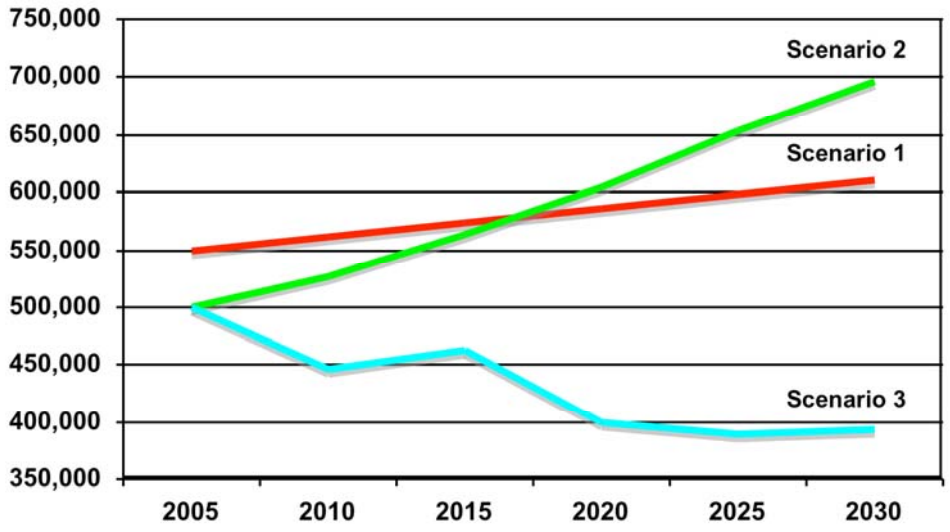
Legend

Scenario 1: Projected ALOS rates remain flat to 2030.

Scenario 2: Projected ALOS rates remain flat to 2030 for 4 age demographic groups.

Scenario 3: Projected ALOS rates to 2030 for 4 age demographic groups mirrors the US reported change in rates by age category from 1980 – 2005.

Greater Hartford Area Patient Days by Scenario
2005-2030



Projected Bed Analysis

Utilizing 80% as the target maximum efficient occupancy rate for hospital, the following projects the number of staffed and operational beds needed by scenario to achieve this target.

Connecticut Statewide Projected Bed Analysis (80% Occupancy)

Based upon the criteria and assumptions in each scenario, the following tables represent the projected number of staffed and operational beds necessary in the state of Connecticut to achieve 80% targeted occupancy from 2005 – 2030. The state of Connecticut currently has 7,231 reported licensed, staffed, and operational short-term acute care hospital beds.

Projections Based Upon 2005 Connecticut Reported Data

Scenario 1	2005	2010	2015	2020	2025	2030
State	7,098	7,349	7,498	7,577	7,598	7,585

Projections Based Upon 2005 US Age Related Data

Scenario 2	2005	2010	2015	2020	2025	2030
State	7,069	7,760	8,252	8,656	9,085	9,432

Projections Based Upon 1980-2005 US Age Related Data

Scenario 3	2005	2010	2015	2020	2025	2030
State	7,069	5,916	5,278	4,380	4,151	4,217

Tripp Umbach Research Findings

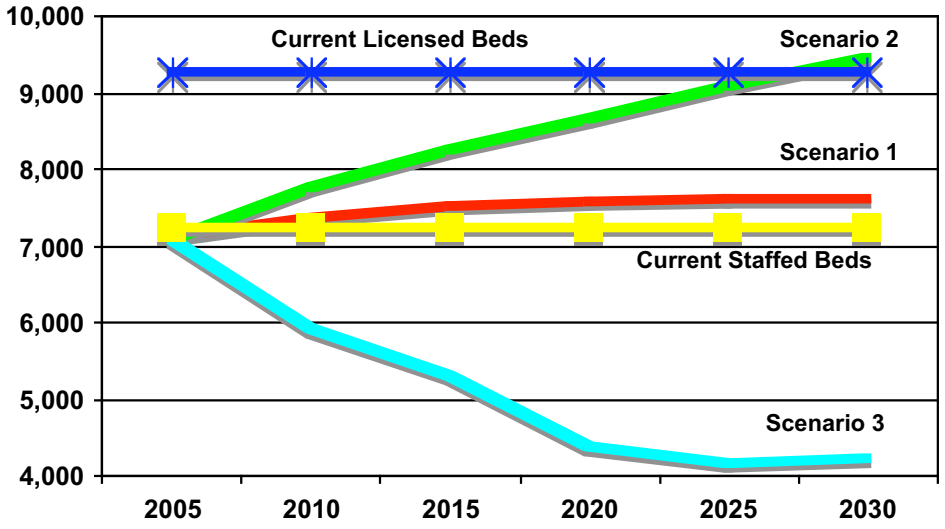
Legend

Scenario 1: Inpatient utilization rates remain flat to 2030.

Scenario 2: Inpatient utilization rates remain flat to 2030 for 4 age demographic groups.

Scenario 3: Inpatient utilization rates to 2030 for 4 age demographic groups mirrors the US reported change in rates by age category from 1980 – 2005.

Connecticut Bed Analysis: Projection by Scenario
2005 - 2030



JDH PSA Projected Bed Analysis (80% Occupancy)

The population in the JDH PSA generated 52,023 discharges in 2005. The hospitals within the area however reported discharges totaling 97,955 which represents significant secondary and tertiary referrals to the area. As shown below, these referrals have been fairly consistent for the past six years:

JDH PSA Hospital Total Discharges
2001 - 2006

	2001	2002	2003	2004	2005	2006
JDH PSA	49,059	49,694	49,653	50,740	52,023	53,312
Sec/Ter	42,336	43,624	43,394	45,006	45,932	45,814
Total	91,395	93,318	93,047	95,746	97,955	99,126

SOURCE: Connecticut Office of Health Care Access Acute Care Hospital Discharge Database FY 01 – FY 06

The percentage of discharges from residents of the JDH PSA relative to the total number of discharges from hospitals in the service area for 2005 will be the basis for future projections.

Projections Based Upon 2005 JDH PSA Reported Data

Scenario 1						
	2005	2010	2015	2020	2025	2030
JDH PSA	944	964	973	981	985	984
Sec/Ter	837	855	863	870	873	873
Total	1,781	1,819	1,836	1,851	1,858	1,857

Projections Based Upon 2005 US Age Related Data

Scenario 2						
	2005	2010	2015	2020	2025	2030
JDH PSA	913	963	1,006	1,051	1,106	1,152
Sec/Ter	810	854	892	932	981	1,022
Total	1,723	1,817	1,898	1,983	2,087	2,174

Projections Based Upon 1980-2005 US Age Related Data

Scenario 3						
	2005	2010	2015	2020	2025	2030
JDH PSA	913	828	852	722	688	683
Sec/Ter	810	734	756	640	610	606
Total	1,723	1,562	1,608	1,362	1,298	1,289

Tripp Umbach Research Findings

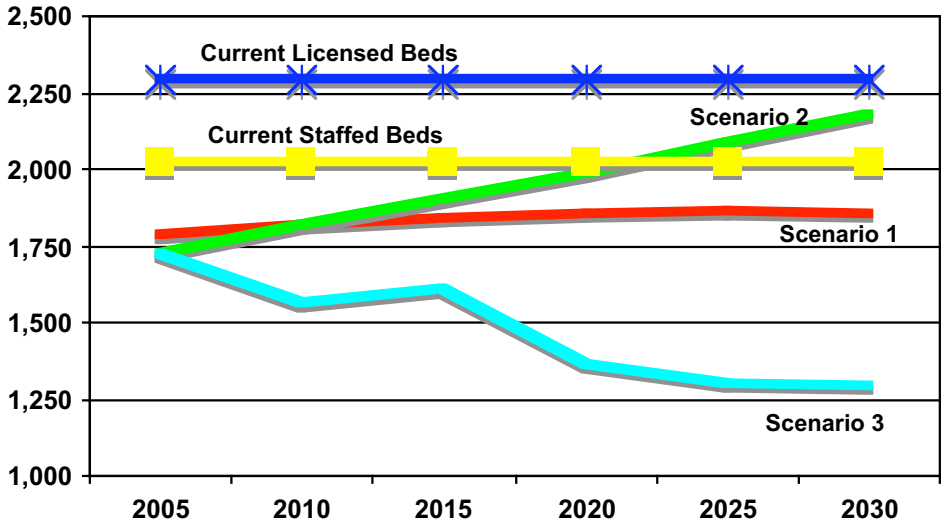
Legend

Scenario 1: Inpatient utilization rates remain flat to 2030.

Scenario 2: Inpatient utilization rates remain flat to 2030 for 4 age demographic groups.

Scenario 3: Inpatient utilization rates to 2030 for 4 age demographic groups mirrors the US reported change in rates by age category from 1980 – 2005.

JDH PSA Bed Analysis: Projection by Scenario 2005-2030



Greater Hartford Area Projected Bed Analysis (80% Occupancy)

Projections Based Upon 2005 Greater Hartford Area Reported Data

Scenario 1	2005	2010	2015	2020	2025	2030
Grt Hart	1,881	1,922	1,962	2,004	2,047	2,087

Projections Based Upon 2005 US Age Related Data

Scenario 2	2005	2010	2015	2020	2025	2030
Grt Hart	1,708	1,805	1,928	2,068	2,237	2,384

Projections Based Upon 1980-2005 US Age Related Data

Scenario 3	2005	2010	2015	2020	2025	2030
Grt Hart	1,708	1,529	1,583	1,365	1,331	1,347

Tripp Umbach Research Findings

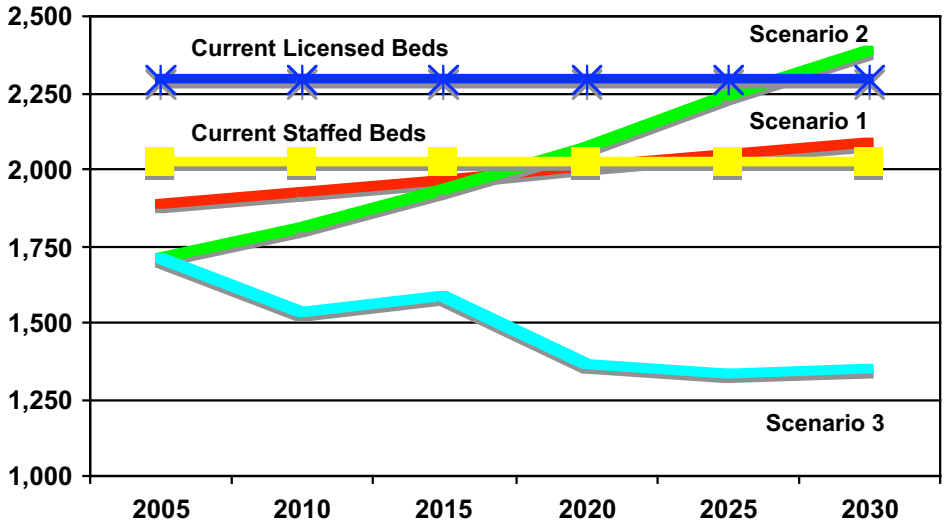
Legend

Scenario 1: Inpatient utilization rates remain flat to 2030.

Scenario 2: Inpatient utilization rates remain flat to 2030 for 4 age demographic groups.

Scenario 3: Inpatient utilization rates to 2030 for 4 age demographic groups mirrors the US reported change in rates by age category from 1980 – 2005.

Greater Hartford Area Bed Analysis: Projection by Scenario 2005-2030



Conclusion

It appears that the most likely scenario of bed need by the year 2030 is Scenario 2. For Connecticut, that means that additional licensed, staffed, and operational beds are needed in the state. In the JDH PSA service area and the Greater Hartford area however, it appears that additional beds may not be necessary until 2020.

Of equal or possibly greater significance is the tremendous growth in the 65+ population and the implications for the healthcare system in Connecticut. As shown, this segment of the population has the highest utilization of inpatient healthcare services and providers must prepare for the demands this group places on physicians, clinical staff, technology, etc.

This is a report based upon the criteria shown and as we all know, healthcare is dynamic and continuously evolving and changing. Could the experiences of the previous 25 years repeat

themselves and drive utilization and ALOS down even further? It is unlikely that this will be the case given the ongoing national debate on healthcare. Issues such as the enormous amounts of uninsured and underinsured, consumer driven healthcare, aging baby-boomers, calls for universal health insurance, the demand for higher quality healthcare, nationwide obesity issues, pay-for-performance, aging physical plants, primary care physician shortages, lack of clinical staffing, eroding hospital operating margins, advances in healthcare, all contribute to the dynamic nature of healthcare. It is critical that the state of Connecticut continue to evaluate changes in national, statewide and regional health needs to effectively plan for the future.

University of Connecticut Health Center Physical Plant Review

Introduction and Overview

To complete the physical plant review, Tripp Umbach retained Burt Hill, an award-winning national firm with specializing in integrated design solutions for academic health centers, universities, hospitals and research facilities. With offices in 10 US locations and three abroad, and over 850 employees, Burt Hill offers architecture, engineering, interior design, landscape architecture, creative services, and master planning services with a particular focus on sustainable design, technology integration, and energy management[16]. Burt Hill conducted a three-day onsite review of UCHC in November 2007, to determine the state of the physical facility and review the options of their master facility plans. The first day of the review was devoted to a facility walk through with an emphasis on the operating suite; inpatient housing; emergency department; imaging; and the mechanical/electrical systems. Two architects, with a collective healthcare design experience of 65 years, and three engineers with a collective healthcare design experience of 50 years participated in the onsite review, and met with administration, physicians, nursing and physical plant staff.

Since the early 2000's, the University of Connecticut Health Center, located in Farmington, has commissioned several department-specific studies including the NICU and the Surgical Suite; in addition they have developed several master facility plans varying in size from a large addition to an entire hospital facility replacement. These studies show a thoughtful progression in vision and scope. The pros and cons of each plan/schematic can be debated on cost; services offered; constructibility; or beds and services. However, It is quickly obvious that the 40-year old physical plant is obsolete in terms of modern healthcare delivery and extremely constricted both by geography and geometry.

The hospital is located in three buildings H (204,753 sq. ft.), F (91,466 sq. ft.), and C (335,518 sq. ft.) for a total gross area of 631,737 sq. ft.[17]. Equipment in the corridors; excessive noise on the in patient levels; lack of privacy for surgical and emergency patients; mechanical and electrical systems that are either maxed out or beyond their anticipated life; and a total absence of swing space all point to a much needed major capital construction project. The top three findings of the three-day evaluation included:

[16] A few client references include: The University of Pennsylvania, Georgetown University Medical Center, Harvard Medical School -- Dubai Center, Dubai, Florida International University and the Cleveland Clinic.

[17] The areas noted are taken from a UConn Facilities AutoCADD file.

- The building is space tight, and additional space is needed to expand or modify any existing department. Without additional space, adjacent departments will need to sacrifice their already inadequate space for the benefit of another department.
- The current standard of care is for private inpatient rooms. The existing configuration cannot incorporate this concept without reducing the total bed count and increasing inefficiencies.
- Many of the existing pieces of mechanical equipment are at the end of their serviceable life and cannot be replaced or upgraded without a new location for the equipment.

Below are the specific and detailed assessments of various aspects of UCHC's current facility. A graphic is presented below which details the current and proposed expansion of the site. This will be a useful reference when reading through the report. Moreover, the key listed below defines and explains specific references to areas within UCHC.

H - Patient Tower, with ER below, part of Surgery
F - Neo Natal ICU, part of surgery, Dietary
C- Entry, Outpatient, Imaging
L- Research building (Long/Narrow)
K - Medical School

The graphic below provides an overview of the UCHC campus and the proposed replacement hospital.

Site Plan – Proposed Replacement Hospital

Overview of Findings

Master Plan Options

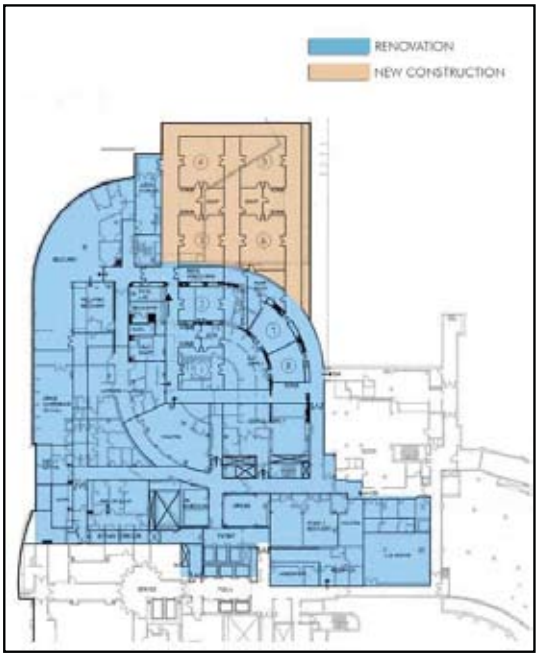
The Master Plan options developed since 2000 represent a very "thoughtful progression in vision and scope." For purposes of this analysis, we have categorized four primary Master Plan options into the following generic categories as defined by the amount of new construction/renovation:

- 60/40 Option (2003)
- 60/40 Option (2005)
- 80/20 Option (2005) (Option presented to the CT General Assembly)
- 100% New Option (2008) (Burt Hill Option)

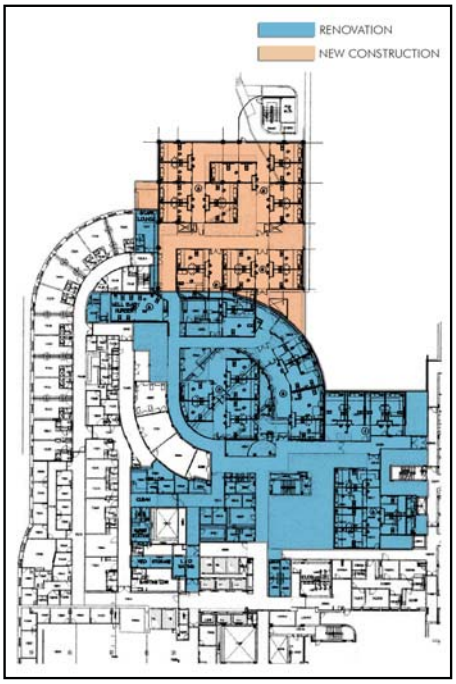
60/40 Option (2003)
Mitchell Architectural Group – April, June, October 2003
Hospital Cost Range: $300,000,000

This option resolves the issues found in the Operating Room, Emergency Department, and Neonatal Department through renovations in the existing building. The Patient Bed Tower addition is added on the F-Building side, adjacent to the existing Patient Tower. This scheme makes excellent use of the existing elevator and corridor circulation, and would relate the new Patient Tower well to the existing circulation paths. The Operating Room renovations accomplish 4 new full-size (650 sq. ft.) Operating Rooms, expand 1 existing Operating Room and keep 2 existing "pie-shaped" Operating Rooms. GI rooms, Holding, Lockers, Office, On-Call, Recovery, Anesthesia Storage, Stage 2 Recovery, and Pre-Op Exam receive some needed attention and in many cases some additional space. New Patient Tower would add four 24-bed Nursing Units with future floor capabilities for 2 additional nursing floors and a future Penthouse for mechanical systems that would allow a movement of mechanical systems into the future Penthouse and the creation of an additional 24-bed patient floor. The 60/40 option also includes a renovation of the NICU to provide 50 bassinnettes and 5 double rooms.

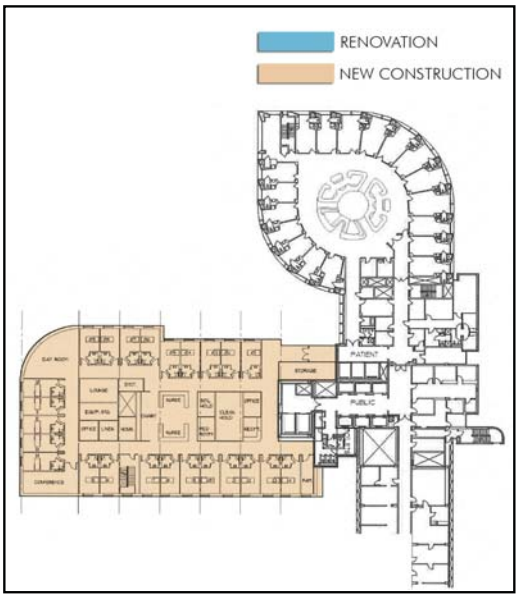
The diagrams on the next two-pages highlight the proposed 60/40 option.



SURGICAL SUITE



NICU



PATIENT TOWER

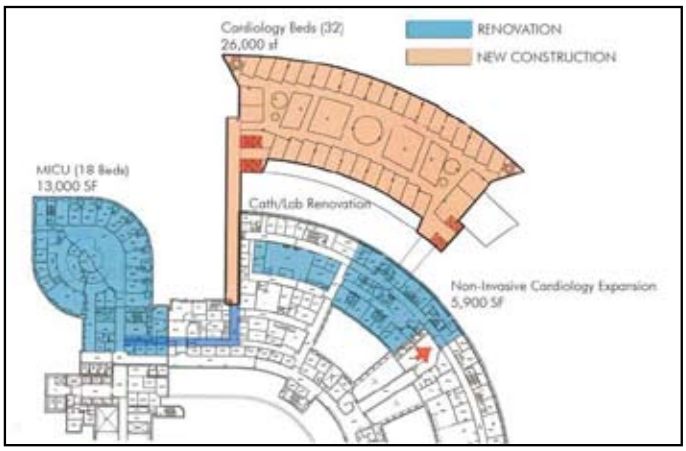
While this option results in an improved functional arrangement, and the consolidation of beds into one location, there are significant issues with the 60/40 approach:

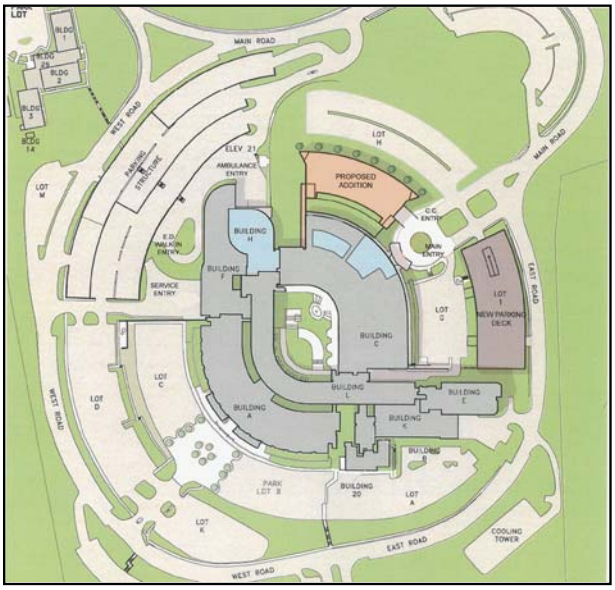
- The end result will not be a signature facility.
- The addition of beds and space is beneficial; however, the end result of renovations perpetuates the functional issues of geometry and lack of flexibility, and inhibits future growth
- New construction occurs in two locations which makes operations difficult.
- Renovation will be multi-phased and difficult for hospital operations.

Tripp Umbach Research Findings

60/40 Option (2005)
CSC Ballinger Associates - May, June 2005
Hospital Cost Range: $300,000,000

Burt Hill believes that this 60/40 option provides adequate space and concentrates new construction in one location. Burt Hill believes that this 60/40 option begins to present a new hospital "signature image." Moreover, there would be new patient beds in the "signature" addition. MICU works well in circular plan Building H.

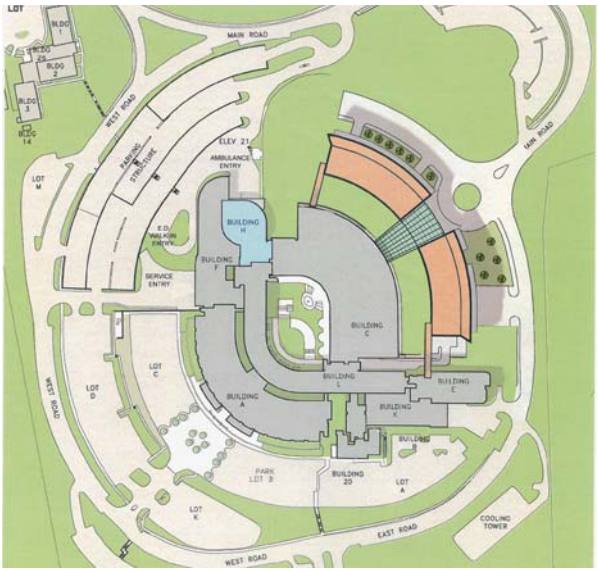




Concept Plan

80/20 Option
2005 Replacement Plan (Proposal Submitted to CT General Assembly)
Hospital Cost Range: $495,000,000

This option, by adding a major addition at the front entrance of John Dempsey Hospital, creates a signature image, by adding all new patient beds, emergency department, a new entrance and lobby. This is the option presented by UCHC to the Connecticut State Legislature for review and discussion. In addition to connecting the new lobby, two additional connection points are planned to make good use of the existing C building and some areas of the H building.



Approximately 100,000 sq. ft. of the existing buildings are renovated in the 80/20 Option to renew the following areas:

- Cancer Center
- Cardiology
- Clinical Lab
- Re-new portions of the existing facility such as public space, systems etc.

Additional parking is provided in a parking facility located below the new addition for improved patient access, and to relieve the stress on parking on the campus. This option, like the 100% option below, would allow for a expansion and renewal of Research, expansion of the Medical School when appropriate, and the design and construction of a state of the art hospital.

A concern with this scheme is the cost and liabilities of constructing at the main entrance (front door), drive and turning circle of John Dempsey Hospital. With construction anticipated to be at least 24 months, this project will require:

- Construction safety and staging plan that coordinates pedestrian and vehicle flow, with the needs of the construction project
- Temporary entrance
- Budget allocations to cover these extra efforts for this option

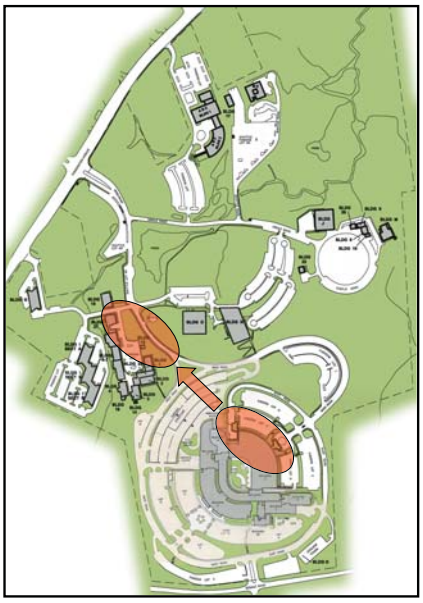
There will be premiums for this option. Along with considering an option such as the 100% Option below, these aspects of the 80/20 Option should be further studied and budgeted.

100% New Option
Burt Hill Proposed New Hospital Option 2008
Hospital Cost Range: $507,000,000

After considering the thought progression of the prior studies, as well as:

- The compromises of the 60/40 plan
- The impacts and costs of the 80/20 plan on hospital access and operations when building at the existing John Dempsey Hospital's front door for two years
- The need for swing space in building H to accommodate renovations to achieve state of the art lab configurations in building L.
- Hospital image
- Need for efficient functional layout
- Need for convenient parking

Some additional onsite options on the campus should be considered and brought to the same conceptual plan level as the earlier studies to communicate the functional plan, massing, site, and costs. One possible scenario is diagrammed on the next page. These studies should include other possible locations and offer options for a complete campus plan that sets the stage for academic medical center growth, and vitality.



100% Option

Based upon our analysis, Burt Hill developed a hillside scheme which consists of a 100% new hospital constructed to the side of the existing hospital entrance, extending down the hill as diagrammed above. The slope could be taken advantage of to allow for department functions and corresponding parking to step up the hill. As patients and visitors drive up the hill, parking and hospital access can be matched to function, e.g., Emergency, Outpatient, Imaging, Inpatient, Clinic Spaces, and Physician Offices. Displaced research space can be phased into the L or H buildings to consolidate research functions.

This type of scheme would allow for an expansion and renewal of research, expansion of the Medical School when appropriate, and the design and construction of a state of the art hospital without the limitations and cost premiums of the 80/20 Option.

Project Cost Evaluation and Construction Inflation

Burt Hill has reviewed the cost assumptions for these plans and is in agreement with the planning level assumptions. Utilizing our own project cost projection and multipliers, the proposed costs are within an acceptable range. However, any selected option must be adjusted for inflation once a schedule is determined. Given higher construction inflation in recent years, should additional study or construction be initiated on any of the proposed options, all of the budgets for the Options

under consideration should be reviewed and updated to account for inflation and to reflect a common construction schedule.

The table below provides cost estimates for both the 80/20 and 100% option for JDH hospital only, the University of Connecticut School of Medicine (SOM) and the combined totals. Both the 80/20 and 100% option involve additional costs outside of the renovation and/or construction of a new hospital to modernize the facility (SOM, Research, Parking). The combined total estimated expense for each option includes an estimated cost of approximately $88 million for the renovation of the vacated JDH for research and academic use. These costs are broken out below but in both options bring the total remodel to the $600 million range.

	80/20 % Option			100% Option		
	JDH/SOM	JDH	SOM	JDH/SOM	JDH	SOM
New Construction	$ 417,415,441	$ 417,415,441		$ 473,758,146	$ 473,758,146	
Renovation	$ 36,353,711	$ 36,353,711		$ -	$ -	
Parking	$ 33,283,260	$ 33,283,260		$ 33,284,742	$ 33,284,742	
Affected Areas		$ 7,938,630				
Research	$ 87,657,516		$ 87,657,516	$ 87,657,516		$ 87,657,516
TOTAL	$ 574,709,928	$ 494,991,042	$ 87,657,516	$ 594,700,404	$ 507,042,888	$ 87,657,516

Notes:
1. Inflation is calculated to the mid-point of construction 2010
2. The 80 / 20 % Option includes a contingency of -- $ 66,124,401
3. The 100 % Option includes a contingency of -- $ 69,391,402

Facility Age and Maintenance

The age for UCHC is approaching 37 years, as the entire facility was constructed all at once. Burt Hill would like to note that average facility ages for the regional hospitals are not available as the average age of a typical hospital is not an accurate indicator of a facility. Each facility is unique with regard to its physical plant, and there is a wide spectrum of facility age ranging from original construction to new construction/remodel. For example, the age of a facility can vary from an original building constructed in the 1930's which is being used as office space to a new patient tower constructed in 2007. It is typical that a hospital has a wide range of buildings varying in age and maintenance/remodeling needs on its campus which present different challenges.

Facility upgrades/improvements and deferred maintenance are faced by UCHC, the regional hospitals and every academic health center/hospital in the country. It was Burt Hill's project

objective to review the UCHC facilities and define what UCHC would need to do in order to become a state of the art facility.

Through our research, we reviewed a Facility Conditions Analysis conducted by ISES Corporation in 2006 for UCHC which details needed improvements in the following categories:

Site	Fire/Life Safety
Exterior Structure	HVAC
Interior Finishes / Systems	Electrical
Accessibility	Plumbing
Health	Vertical Transportation

Costs Identified in this study for improvements were[18]:

Building H – John Dempsey Hospital Patient Tower $27,564,465
Building C -- John Dempsey Hospital Clinical $32,679,892
Building L – Research $120,283,448

The current facilities are not up to the standard definitions of code requirements but have been grandfathered in based upon the original age of the facility. Facility upgrades/improvements and deferred maintenance are issues that need to be addressed at UCHC.

UCHC Comprehensive Facility Review

Operating Suite

The 10-room OR suite, level one, is lacking storage space and the OR's are very undersized by current standards. The total number of rooms is not a critical issue for current levels of cases, when taken in context of the recent addition of the 4 OR suite in the Medical Arts Building. With the open heart program there should be at least one, if not two, OR's at a minimum of 650 sq. ft. In addition to being undersized, the OR's are built around a "sterile" core which makes it very difficult to expand or modify the suite. Many OR suites have space shortages, but in addition UCHC has a very odd geometry with a circular plan that enhances the inefficiencies. The pie shaped rooms are not optimal for equipment placement or the

[18] These costs are presented in the ISES report in detail and would renew the existing buildings.

introduction and adaptation of new equipment and techniques, such as minimally invasive surgery.

The corridors of the suite are clogged with equipment that does not have assigned storage space. It should be noted that this is not unusual in most OR suites, however, UCHC is an extreme example of the problem. The congestion stretches into the central core where mobile carts have been added to store sterile packs inhibiting the flow of physicians and staff during scrub.

Both the pre- and post- operative areas are based on an open-ward concept which has been eliminated or minimized over the past decade by many facilities. Consideration needs to be given to the number of private rooms in both pre- and post-operative areas. To exacerbate the space shortage, the pre-operative area prepares patients for other procedures than those delivered in the OR suite. In addition, a holding area has been given over to infusion therapy which is unusual for facilities with adequate space.

As will be seen in the mechanical sections of this report, the existing mechanical systems do not meet current standards and have outlived their life expectancy. It is a only a matter of time as to when these systems will need to be replaced, which will be very difficult and expensive within the existing space and configuration.

Inpatient Housing

The existing inpatient bed complement of 224 beds can be broken down as follows:

Medical Surgical	**108**
Corrections	**12**
NICU	**40**
Healthy Newborn	**10**
Psych	**34**
OB, Labor & Delivery	**20**
Total Beds	**224**

The odd, leaf-shaped plan of the inpatient tower (level one through level seven) has multiple shortcomings that span all of the nursing units. On the Acute Care floors, the departmental gross area of 12,600 sq. ft. results in 443 gross sq. ft. per bed, or roughly half of what current standards would suggest for an all private bed unit. The initial observation is that the units include primarily semi-private rooms, which should be minimized or eliminated. Current codes and standards require private rooms which have been proven to shorten length of stay;

enhance privacy; reduce potential hospital caused infection[19]; improve staff and family interaction; and provide for a more positive patient/family experience. Because the medical center only has a total of 108 medical/surgical beds and many are semi-private the staff is required to "bed block." This is the practice of using semi-private rooms as private rooms to manage gender differences; separate patients by acuity level; and to minimize the possibility of cross infection. The patient rooms, in addition to being pie shaped, are undersized and possess a difficult geometry for modifications. The glass front of the medical/surgical (acute care) beds minimizes patient privacy. The design of the central nurse's station without significant enclosed storage space or utility rooms helps to create a crowded an disorderly appearance. The original plaster ceilings do nothing to alleviate the level of noise pollution. Because of the central open station, the noise is distracting, and in conjunction with open patient room doors, provides and overall increase in stress and anxiety for patients and staff; this is not a direction that patient care has been heading for the past decade. With the proliferation of computers, the noise, appearance of clutter, and the additional heat generation all contribute to the overall impression of obsolescence.

NICU

The NICU is primarily an open-ward type space that is noisy, cluttered and offers no privacy for families. It is a desire by administration and staff to provide more private rooms in this department, which is more typical in NICU environments at academic health centers. The department's location adjacent to the well-baby nursery allows for the sharing of support staff which is a benefit.

Emergency Department

The department, which is located on the main level of the facility, was originally designed as a series of open-wards, which cannot maintain any patient privacy or family comfort in today's healthcare environment. There are 18 stations in the emergency department which is 4 short of the 22 rooms needed for the 28,000 annual emergency department visits according to current standards. Due to the shortage of rooms, the staff utilizes the corridor for holding patients or if necessary, for treating them. While the adjacency to the imaging department is good, the lack of intra-department imaging equipment results in emergency patients delaying scheduled procedures for outpatient procedures. Because the emergency department is landlocked, there is no reasonable method of expanding and modernizing the department. Current recommendations from the National Institutes of Health (NIH) would require the

department to be constructed in isolation from the rest of the facility, which is not possible with the existing layout and mechanical system at UCHC.

Imaging Department

The department, which is located on the main level seems to be well organized and is nearly 100% digital. However, due to lack of space, new equipment cannot be added to the department without delays in treatment of the remaining modalities.

Electrical Service

The existing utility electrical service serves the entire facility and has the capability to serve a 550,000 sq. ft. addition, as the existing facility was originally constructed as an "all electric" building. The emergency generator capacity would need to be increased if a substantial addition were added to the gross building area. There is a notion that the data center should be relocated to an off-campus site. Due to the excellent reliability of the existing service, Burt Hill believes that serious consideration should be given to keeping the data center within the existing hospital site.

The existing utility service consists of three 21.5KV feeders, one of which is physically separated from the other two. The 21.5KV feeders serve 9 (nine) 2-and 3- transformer spot networks which provide excellent reliability. The spot networks serve risers throughout the facility, including the Hospital. The spot networks are not dedicated to any portion of the building (i.e., the Hospital spot networks are not dedicated to the Hospital functions). It is noteworthy that UCHC has agreed to participate in a state negotiated electrical rate which also allows utility peak shaving (interruptions) upon notification.

Emergency Power Generation

The entire facility, with the exception of building E (the Animal Research Building) ARB, is backed up by 2-800KW and 1-940KW diesel generators operated in parallel. The generators are in good condition and are adequate to serve the life safety requirements of the facility, but the system has little capacity to serve essential hospital loads, such that any additional space will require additional emergency power. Typically, hospital emergency power systems provide 8 to 10 watts/sq. ft. while the existing system provides less than 2 watts/sq. ft.

Electrical Distribution

The main switchboards are in fair condition, but do not conform to current standards. Specifically, they do not provide "selective coordination" which is required within healthcare facilities. The automatic transfer switches are in good condition. The distribution system serving equipment at the point of use is beyond its useful life and is installed in a manner which

does not conform to current codes. Hospital normal/emergency power is not separated from building C distribution and electrical closets are too small. Patient and exam bed location normal and normal/emergency receptacles are minimal and also do not comply with current codes.

Lighting

The facility has eliminated the majority of incandescent lighting and installed new, more energy efficient, fluorescent lighting.

Fire Alarm

The fire alarm system is in good condition and provides voice annunciation in accordance with current requirements.

Nurse Call

The facility has recently replaced approximately 80% of the existing nurse call systems with new Westcom systems.

Telecommunications Systems

The telecommunications cabling plant and infrastructure is collocated within electrical closets, with cabling terminations and network electronics being wall mounted. Network edge switches are located on open shelves. Optical fiber is used in the system backbone with the cabling to outlets observed as Category 5 type cabling. Currently, inaccessible “hard” ceilings are located throughout the facility which is a challenge for modifying and creating organized pathways to support telecommunications cabling. Wireless Ethernet is provided in the H building inpatient floors.

No electronic surveillance (security cameras) was observed in the facility, but card access is provided within the facility in highly sensitive areas. A systems upgrade for physical security on campus is currently being planned.

In order to keep current, mission-critical building and medical system applications will increasingly become IP network based. Dedicated telecom rooms and pathways are needed to support these systems in a robust and flexible way. ANSI/TIA/EIA 568 and 569 telecom infrastructure standards provide recommendations for deploying network infrastructure. Category 5e/6 cabling will permit deployment of Gigabit Ethernet to the desktop. 50 micron laser optimized optical fiber in the backbone will permit future deployment of 10 Gigabit Ethernet.

Expansion Considerations

A new electrical service consisting of transformers to provide 20 watts/sq. ft. to serve an addition or a new hospital expansion. The transformers would be connected to new switchgear containing draw-out circuit breakers which provide required selective coordination and ground fault protection.

New, diesel generator sets would be required to provide approximately 10 watts/sq. ft. of emergency power. The system would consist of (2) generators, operated in parallel. The generators would serve a minimum of three automatic transfer switches for hospital distribution as required by the National Electric Code.

Mechanical Systems

Boilers

There are 4-600 BHP 125 psi dual fuel boilers located in building E, installed in 1998. These boilers feed the entire complex. There is one 600 BHP low pressure boiler and 1-150 BHP boiler in building L. There are also several electric boilers scattered throughout the facility used as backup. At this point, the boilers are adequate for the square footage served on a total facility level. As existing electric preheat coils are replaced with hydronic preheat, any reserve boiler capacity will be absorbed. An addition of any size to any part of the complex will require additional boiler capacity.

Chillers

There are 6-1,000 ton chillers, installed in 1998 (3 centrifugal and 3 steam absorption) in building K which feeds the entire complex. There is a gas fired absorption machine in building F which is “off” and scheduled to be replaced with an electric centrifugal chiller. At this time the chillers are marginal for the square footage served in the complex. Absorber machines are typically problematic due to design and refrigerant type. With absorber machines, additional capacity is typically needed due to down time of equipment. An addition of any size to any part of the complex will require additional chiller capacity.

Air Handling Equipment

Each building on campus has a variety of air handling units installed of various styles and ages. Most units are electrical preheat and electric reheat but are slowly being converted to hydronic. Building H has air handling units installed in 1972 with constant volume reheat in the core and induction units in the patient rooms. Building C has air handling units installed in 1972 with constant volume reheat return air systems. Building F and lower portions of building H have air handling units installed in 1993 with constant volume reheat systems. Building A and L have

air handling units installed in 1972 with constant volume reheat systems. Building E and K have air handling units installed in 1998 and are in like new condition.

The H building with the 1972 vintage air handling units should start a phased replacement of these units. Per ASHRAE technical committees TC 1.8, estimated service life is 25 years for air handling equipment. Although well maintained, the units today are 10 years beyond their estimated service life. Phased replacement of the induction units and interior systems should be accomplished when floors are renovated. A careful phasing plan for Air Handler replacement must be developed. This will involve finding or creating space for the first units so that outages are minimized.

Mechanical Systems – Sanitary

With the increased area of each option, the sanitary discharge must be planned with the municipality, and budgeted into the construction cost.

Expansion Considerations

Any additional square footage any place in the complex would require additional chiller and boiler capacity; adding one additional 600 BHP boiler will allow an addition of around 425,000 sq. ft. depending upon internal loading and usage. For each 1,000 ton chiller, an additional 225,000 sq. ft. could be added depending upon internal loading and system design. Any renovated space in the complex with equipment older than 15 years must incorporate air side equipment and floor system replacement. Aged units should be replaced with modern equipment including steam or hydronic reheat and variable frequency drives. Floor systems should be variable volume reheat where applicable with hydronic reheat. Hydronic or steam heating is recommended since the current utility rates have electric heat costs at 2.4 times that of natural gas. 100% outside air air handling units should be converted to return air where applicable. If 100% outside air is required, heat recovery should be incorporated.

Specifically, if a building in the range of 250,000 sq. ft. is added to the complex, additional chillers, cooling towers, and associated pumping system would be required totaling approximately 1,250 tons. Additional steam boiler capacity of 300 boiler horsepower would be required. Since space exists in the existing boiler plant for an additional 600 boiler horsepower boiler, that size unit should be installed.

Research

The team also evaluated the research space currently available at UCHC. The table below is a detailed inventory of space available by department.

DEPT	office	clinical/ancillary	wetlab	support	
00304 MOLECULAR & STRUCTURAL BIOLOGY	3,003	-	14,174	5,110	
00307 PHARMACOLOGY	523	-	9,185	1,346	
00308 CELL BIOLOGY	1,552	-	4,157	1,355	
00313 NEUROSCIENCE	4,639	-	12,042	5,193	
00317 GENETICS & DEVELOPMENT BIOLOGY	2,349	-	13,848	9,697	
00319 IMMUNOLOGY	7,015	-	18,336	8,868	
00107 LABORATORY MEDICINE	-	-	-	84	
00107 LABORATORY MEDICINE - Medicine	1,114	-	1,851	1,223	
00107 LABORATORY MEDICINE - Endocrinology	2,329	-	4,768	1,119	
00107 LABORATORY MEDICINE - Gastroenterology	1,603	-	1,034	576	
00107 LABORATORY MEDICINE - Oncology	341	-	1,803	255	
00107 LABORATORY MEDICINE - Infectious Disease	432	-	1,144	-	
00107 LABORATORY MEDICINE - Occupational Medicine	1,472	-	6,035	1,811	
00107 LABORATORY MEDICINE - Pulmonary	463	-	-	-	
00107 LABORATORY MEDICINE - Rheumatology	139	-	309	-	
00109 PEDIATRICS	371	-	878	76	
00111 SURGERY	2,384	-	5,470	1,311	
00115 ORTHOPEDICS	3,276	-	7,268	2,714	
00122 NEUROLOGY	593	1,849	741	133	
00126 NEAG CANCER CENTER	1,258	-	1,304	655	
00140 CALHOUN CARDIOLOGY	645	-	2,221	2,371	
00120 ctr - MOLECULAR MEDICINE	820	-	3,840	3,693	
00125 ctr - CENTER ON AGING	2,263	698	1,511	-	
00141 ctr - CENTER FOR CELL ANALYSIS & MOD	2,578	-	6,158	903	
00316 ctr - CLINICAL RESEARCH CENTER	4,362	2,745	753	123	
00318 ctr - CENTER FOR VASCULAR BIOLOGY	1,027	-	5,844	4,862	
00250 ORAL REHAB,BIOMATRLS,SKEL DEV	3,356	-	7,230	1,920	
00251 ORAL HEALTH AND DIAG SCIENCES	2,432	-	4,576	1,055	
00252 ORTHO ORAL & MAX SURGERY	1,235	-	2,030	584	
	53,570	**5,292**	**138,509**	**57,038**	254,409

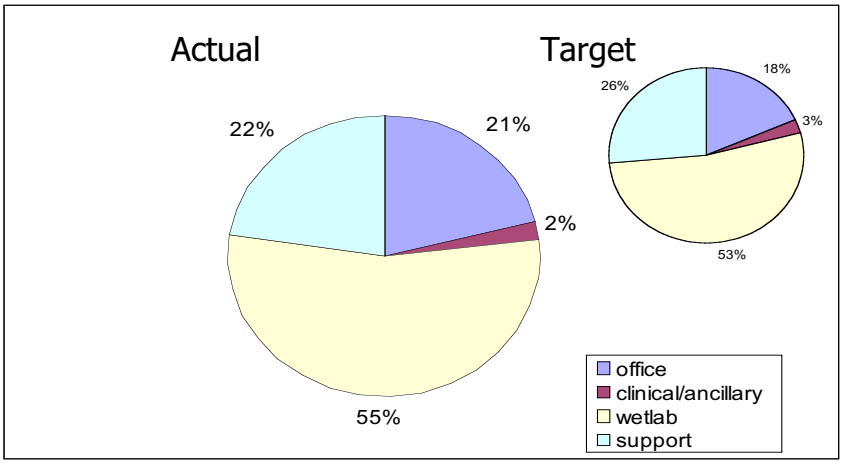
Derived From UConn "Dollar Density Report", FY '07 – Wet Labs Only

The above data was then utilized to do a comparative analysis with targets established by the NIH regarding space allocation. The results show that UCHC's research space is nearly a perfect match with NIH targets.

Tripp Umbach Research Findings

distribution
actual

office	clinical/ancillary	wetlab	support	
53570	5292	138509	57038	
21%	2%	54%	22%	100%



Farmington – Research Space Per Primary Investigator
Comparison to NIH Targets for Bioscience Wet Labs:

Analysis - Comparison to NIH		
Overall Area - Lab & Lab Support	**254,409**	
PI Count*	**300**	
	848	sf/pi
assuming NIH benchmark of	188.40	sf/fte
this is appropriate for a typical team of	4.50	fte

* Derived From UConn "Dollar Density Report", FY '07

Farmington – Research Funding Per SF
Comparison to UConn Targets for Grant Revenue/SF*

Analysis - Comparison to $/SF targets	
Total Area	254,409
Total Funding	$ 57,353,164.17
$/sf - actual	$ 225.44
$/sf - target	$ 310.00
variance	27%

* Derived From UConn "Dollar Density Report", FY '07

With regard to research, the current research space allocations align reasonably well with NIH benchmark for average research team sizes of +/- 4.5 FTE. The lack of flexible, open lab areas makes it difficult to optimize allocation of research space on a grant money/sq. ft. basis. Older facilities, particularly building "L," do not provide flexible planning. Based on evaluation, it is clear that the Building L footprint will support reconfiguration to an open, flexible laboratory planning paradigm. Additionally, the Building H footprint will support reconfiguration to open, flexible laboratory planning paradigm.

Conclusions and Considerations

Based on our comprehensive analysis, Burt Hill concludes that a 60/40 option would not meet the needs of UCHC. The chart below profiles Burt Hill's overall evaluation of the overall academic medical center (hospital, research, medical school). The graphic is designed to be read from left to right, moving from the current conditions, to reach the objectives, a method to achieve those objectives and which plan will accomplish the objectives. It is Burt Hill's belief that the only plans that would meet UCHC's ultimate goals of being an academic center of excellence would be either the 80/20 plan or the 100% plan.

	From	To	How	Which Plan
Hospital	A healthcare facility with an institutional image, a constructed and obsolete functional plan and physical plant.	An image with efficient, effective plan and physical plant	Give up obsolete healthcare space for research through a new state of the art facility strategy.	80/20 or 100%
Research	A research facility with an appropriate image, with a lack of flexible open lab space. It is adequate for current research needs.	Create flexible lab space meeting current criteria that will complement recruitment and retention of researchers.	Renovate Building L, use Building H for the flexible space to allow for Building L renovation. Use Building H for research recruitment.	80/20 or 100%
Medical School	An excellent facility for the current student population with an effective functional plan and appropriate image.	Maintain the effectiveness of the current facility and provide for future needs.	Evaluate, define and further develop key relationships between clinical and research departments to maintain UConn's "edge."	80/20 or 100%

Clinical Facility

Overall, the hospital is limited in what it can modify or add by virtue of the strong geometry and absence of open spaces within the building. The lack of privacy within the facility should be corrected but this cannot be accomplished within the existing envelope without severely

compromising the existing services offered or the maintenance of a safe patient and family environment.

Any additional square footage any place in the complex would require additional chiller and boiler capacity; adding one additional 600 BHP boiler will allow an addition of around 425,000 sq. ft. depending upon internal loading and usage. For each 1,000 ton chiller, an additional 225,000 sq. ft. could be added depending upon internal loading and system design. Any renovated space in the complex with equipment older than 15 years must incorporate air side equipment and floor system replacement. Aged units should be replaced with modern equipment including steam or hydronic reheat and variable frequency drives. Floor systems should be variable volume reheat where applicable with hydronic reheat. Hydronic or steam heating is recommended since the current utility rates have electric heat costs at 2.4 times that of natural gas. 100% outside air air handling units should be converted to return air where applicable. If 100% outside air is required heat recovery should be incorporated.

Specifically, if a building in the range of 250,000 sq. ft. is added to the complex, additional chillers, cooling towers, and associated pumping system would be required totaling approximately 1,250 tons. Additional steam boiler capacity of 300 boiler horsepower would be required. Since space exists in the existing boiler plant for an additional 600 boiler horsepower boiler, that size unit should be installed.

Research Facilities

In order to enhance the research space and research productivity at UCHC, the following is recommended:

- Provide more open plan research lab areas in building H and L.
- Undertake incremental renovations to buildings H and L.
- Coordinate renovations in order to maintain adequate “swing space” during renovation process.
- Convert “swing space” to expansion space at conclusion of renovation process.
- Optimize research productivity/sf by adjusting allocations for underperforming groups.
- Co-locate these groups with high performers in larger open lab areas, modulate space allocations as appropriate.
- Focus on developing research activities in conjunction with targeted clinical “centers.”
- Pair clinical areas with research activities that require close proximity to patient populations.

Academic Facilities

With a maximum class size of 80 students per class in medical school, 40 per class in the dental school, and 125 students enrolled in PhD programs, the current facilities are excellent for this population. Facilities appear to be well utilized and some renovation has occurred in order to keep pace with changes in pedagogy/technology. However, it is noteworthy that expansion of the academic facility would be required if class sizes were to increase, and the facility will need to be modernized to keep pace with other medical schools around the country. Students continue to look for certain amenities and technologies as essentials to their lifestyle and education needs.

The academic facilities are among the best in the country because of their strong integration with research and clinical facilities. The library is well located and well equipped. The dental school and medical schools are well respected. Moreover, the medical and dental students are instructed side-by-side for the first two years. The curriculum has been lauded as one of the most innovative in the country. The direct proximity of the academic side of the house to the clinical and research programs offers UConn a competitive advantage when compared to other facilities around the country.

Economic Impact Quantification Study

Introduction

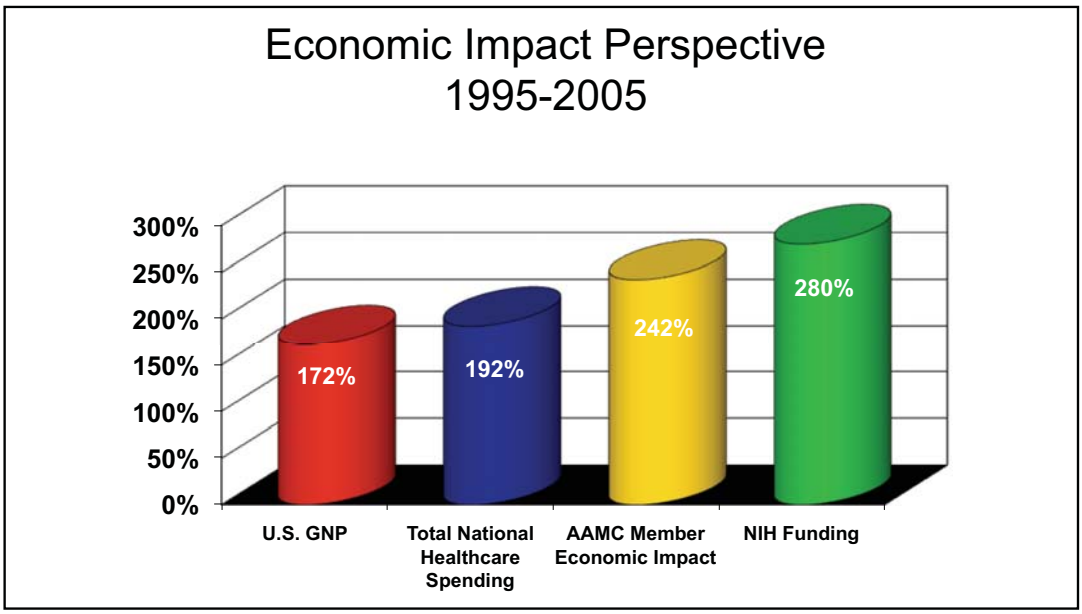
Tripp Umbach developed customized models that calculate the economic, employment, and government revenue impacts associated with UCHC's operations in three distinct years (1995, 2000 and 2007). Data used by Tripp Umbach was provided through materials provided by UCHC and supplemented by Tripp Umbach's previous research with 125 research medical schools, 400 teaching hospitals and research enterprises throughout the United States. It is important to note that much of the data included in Tripp Umbach's models are based on actual historical data from similar sized organizations and entities. Additional data included in this report is also from Tripp Umbach's Association of American Medical College's annual economic impact study of all academic health centers in the country (2005 most recent study year).

To calculate the economic impact of UCHC, Tripp Umbach used a methodology derived from the original set of research tools and techniques developed for the American Council on Education (ACE). The ACE-based methodology employs linear cash flow modeling to track the flow of institution-originated funds through a delineated spatial area. Traditional economic impact studies are based on direct spending and re-spending within the economy (multiplier effect) driven from the institution itself. Forward-linkage models measure the broader impacts that occur or may occur in the economy as a result of the research and development activities of an institution – beyond the traditional direct and indirect impact. The data presented in this report represent annual, point-in-time economic snapshots of UCHC's impact on the state economy. In addition to calculating UCHC's economic impact, Tripp Umbach also completed impact modeling at the national and statewide level. Data from Tripp Umbach's AAMC economic impact study, which is calculated utilizing the same methodology, are also included in this report.

National Impact of AAMC Member Institutions

Healthcare and the life sciences comprise one of the largest sectors of the United States' $12 trillion economy: comprising a total of 13%. This $1.8 trillion slice spent on health care is only expected to grow, reaching 17% by 2010 and more than 20% by 2040. This will continue a decades-long trend; in 1945 health care spending was only 4% of the US economy. The rising cost of health care will be one of the greatest economic challenges in our current century. The figure below illustrates how the change in the economic impact of AAMC members from 1995-2005 compares with the changes in national GNP, total national healthcare spending, and Federal spending through the National Institutes of Health (NIH).

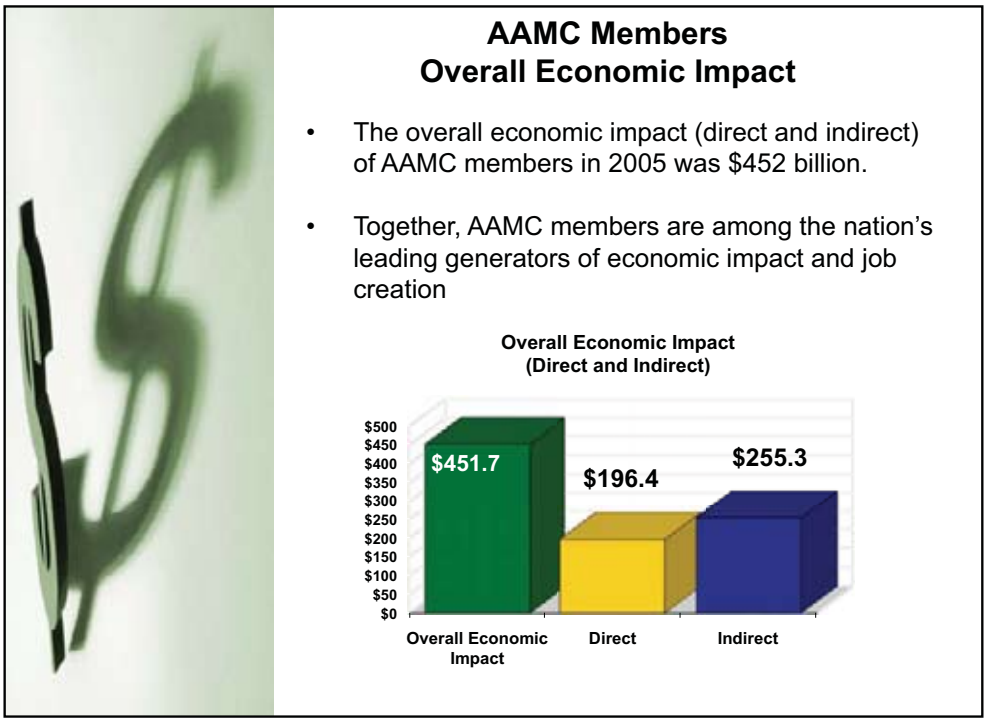
The total economic impact of the AAMC membership in 2005 is nearly two and a half times higher (242%) than the total impact of the membership in 1995. The total economic impact of AAMC institutions was $186 billion in 1995 and $451.7 billion in 2005. The economic impact of AAMC members has significantly outpaced the growth of the Gross National Product of the US, which has grown by 172% over the period 1995 – 2005. The US GNP has grown from $7.3 trillion in 1995 to $12.5 trillion in 2005, according to the US Department of Commerce. The impact of academic medicine has even outperformed the highly publicized rise in total healthcare spending, which has increased 192% in the period 1995-2005. Healthcare spending equaled $988.5 billion in 1995 and $1.9 trillion in 2005. NIH funding during the period 1995-2005 actually outpaced the economic impact of AAMC members, posting an increase of 280% over the ten-year period.



In January 2006, the AAMC retained Tripp Umbach to measure the economic impact of AAMC member institutions on the 46 individual states (and the District of Columbia) in which they are located as well as the nation as a whole. Findings presented in this section of the report present results of the combined economic impact that AAMC members have on states and the country.

During 2005, the combined economic impact of AAMC members equaled nearly $452 billion.

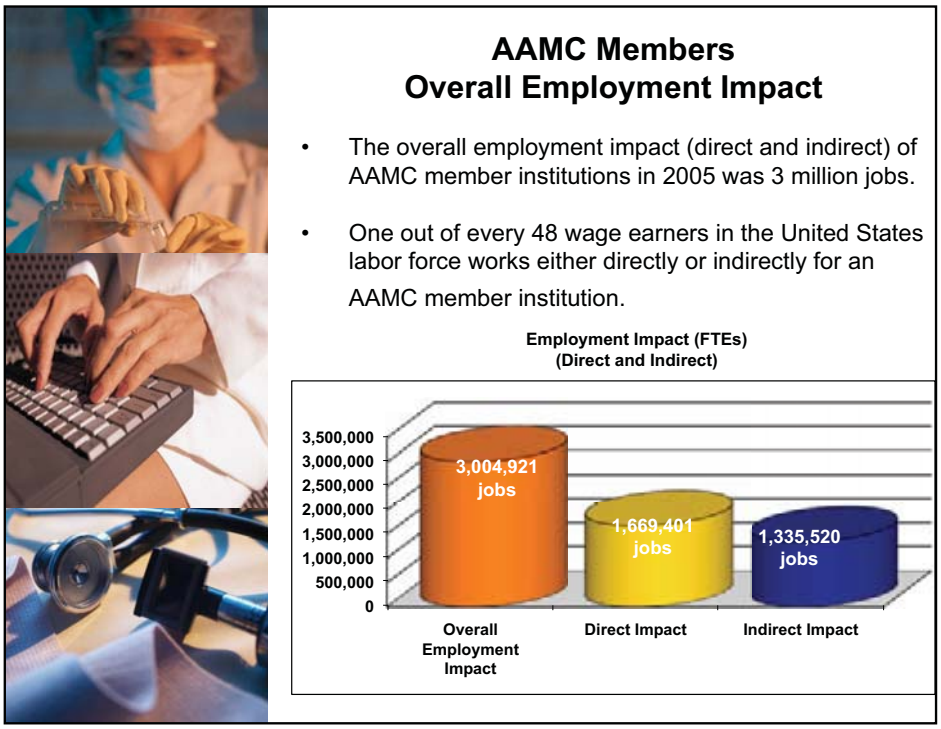
Tripp Umbach Research Findings



AAMC members accounted for more than 3 million full-time jobs. Perhaps the benefit that comes closest to home is the sheer number of US citizens who depend on AAMC members, either directly or indirectly, for their jobs and livelihoods. A total of 3,004,921 jobs in the United States in 2005 were directly or indirectly attributable to AAMC members. One out of every 48 wage earners in the United States labor force works either directly or indirectly for an AAMC member. Even on a direct employment basis, AAMC members are responsible for a substantial component of national employment. During 2005, AAMC members employed a total of 1,669,401 full-time equivalent persons. This includes staff, physician employees, and independent physician contractors. It also includes residents, who are paid a stipend while they continue their graduate medical educations.

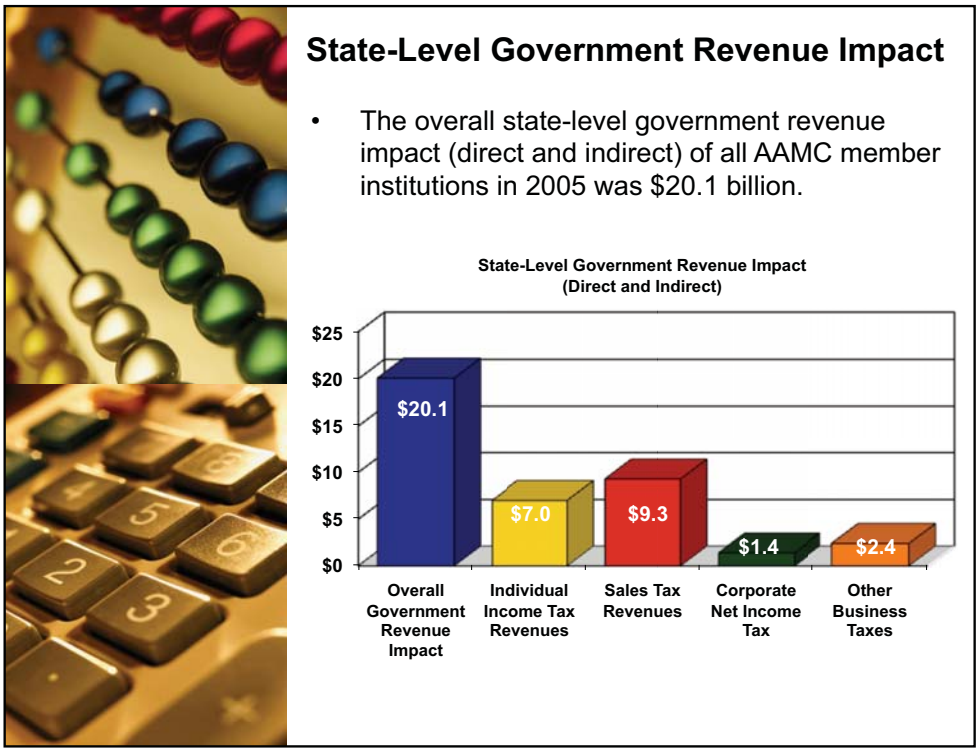
While direct employment is significant, the actual extent of employment impact on a state stemming from AAMC members is considerably larger. The business volume generated by AAMC members creates jobs in a broad range of sectors throughout the nation's economy. These jobs are proportionate to the need to service the AAMC members themselves and their related populations (staff, physicians, students, etc.). In addition, the tax revenues generated at the state and local levels by AAMC members and their business volume also create government employment opportunities.

Direct Employment is equal to total employees based on Full-Time Equivalents (FTEs). Indirect employment is the additional jobs created as a result of the institution's economic impact. Local companies that provide goods and services to an institution increase their number of employees as purchasing increases, creating an employment multiplier.



A major misconception held by business leaders, elected officials, and the general public is that medical schools and teaching hospitals do not generate government revenue. While AAMC members are generally not-for-profit institutions, state government receives substantial revenues as a result of both the direct and indirect influence of these medical schools and teaching hospitals. AAMC medical schools and teaching hospital members provide significant revenue in state income taxes. In addition, the substantial spending with state business generates large-scale revenues for each state in the form of sales tax, corporate net income tax and capital stock/franchise taxes.

AAMC members generated more than $20 billion in total state tax revenue generated through income taxes and sales tax, corporate net income tax, and capital stock/franchise taxes produced by businesses who receive revenue from AAMC members.

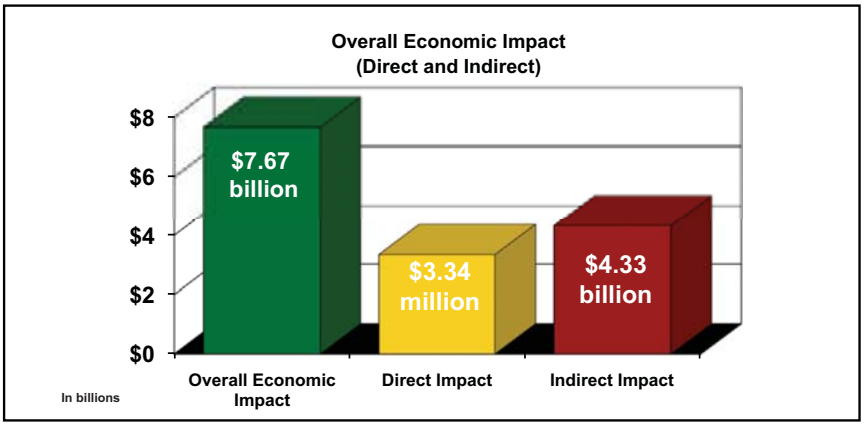


AAMC member organizations have substantial economic and social impacts to their multi-county regions and within the counties and cities where they have operations. Substantial local and regional tax impacts, while beyond the scope of this study, are measured in the billions. Communities in all regions of the country typically rely on these organizations for job creation, advanced research, new business development, and education of medical professionals.

AAMC Members in the State of Connecticut
Economic Quantification Study

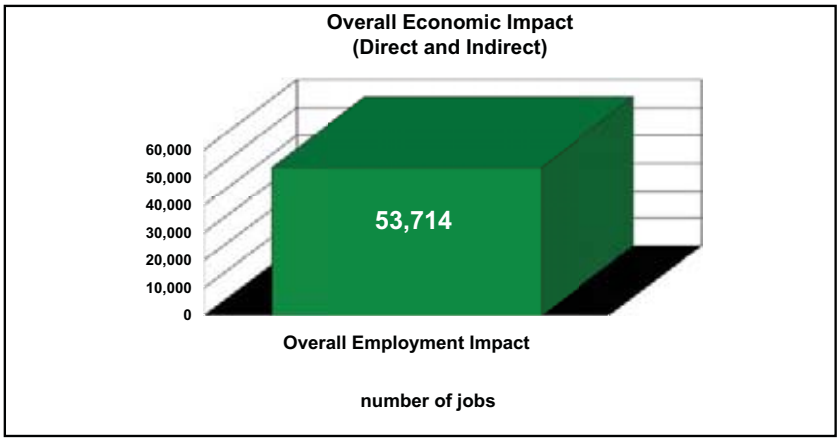
Economic Impact

Overall, Connecticut ranks 18th in the AAMC study. In the state of Connecticut, AAMC members (medical schools and their affiliated teaching hospitals) generated $7.67 billion in overall economic impact; $3.34 billion direct impact and $4.33 billion indirect impact. Included within this number are the University of Connecticut School of Medicine and Yale School of Medicine and their respective affiliated teaching hospitals.



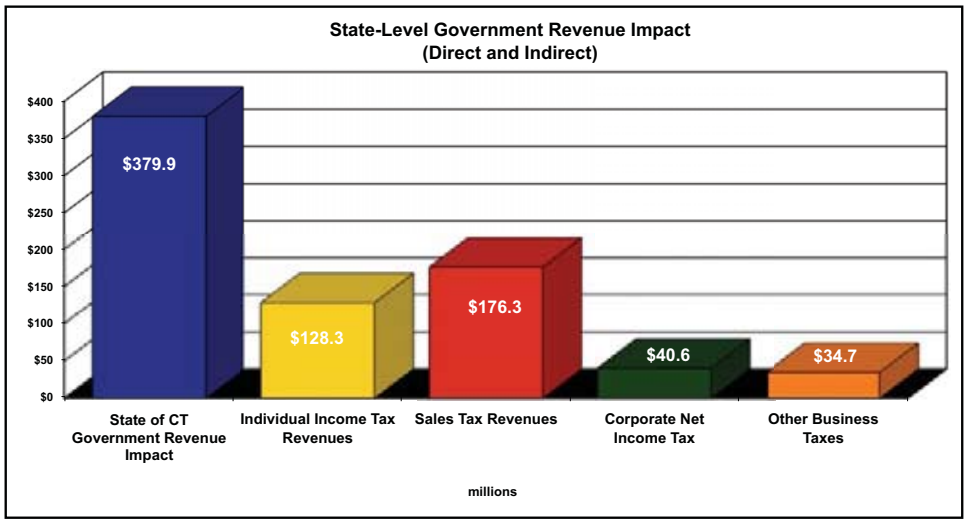
Employment Impact

In the state of Connecticut, AAMC members (UCHC and Yale-New Haven and their affiliated teaching hospitals) generated a total of 53,714 jobs (direct and indirect).



Government Revenue Impact

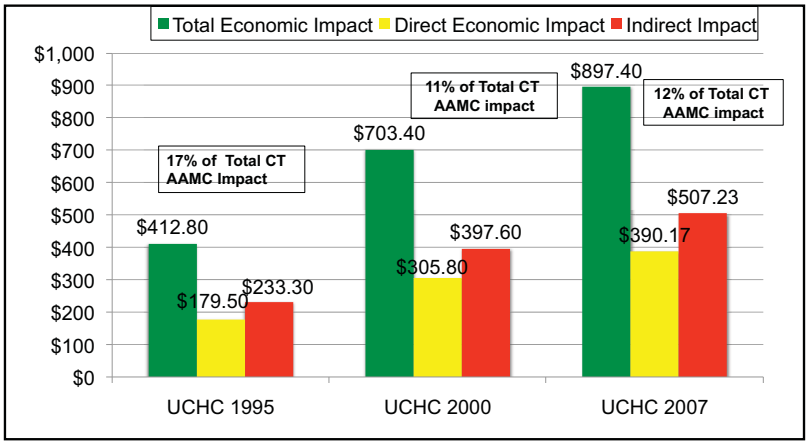
The overall state-level government revenue impact (direct and indirect) of AAMC members on the state of Connecticut in 2005 was $379.9 million. This government revenue impact is comprised of individual income tax, sales tax revenues, corporate net income tax, and other business taxes.



University of Connecticut Health Center Economic Quantification Study

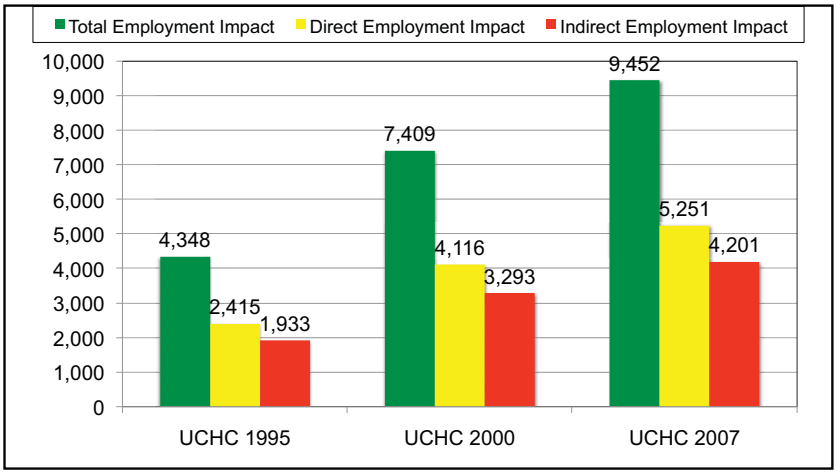
Overall Economic Impact

The overall state-level economic impact (direct and indirect) of UCHC's enterprise on the state of Connecticut in 1995 was $412.8 million (17% of AAMC CT Total), in 2000 it was $703.4 million (11% of AAMC CT Total) and in 2007 was $897.4 million (12% of CT Total).



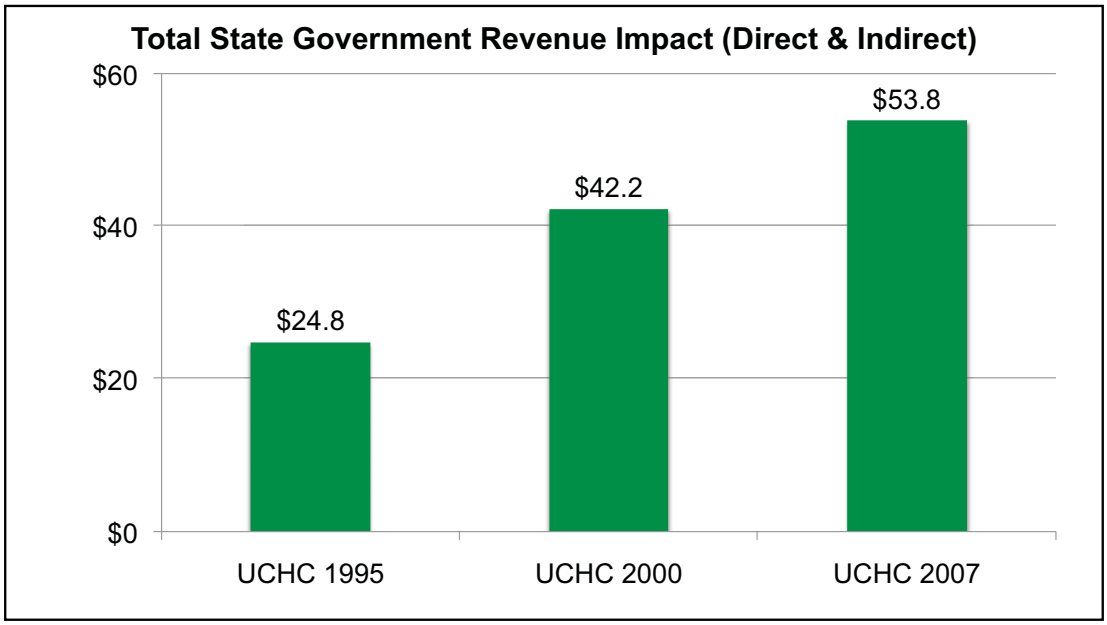
Employment Impact of UCHC

The overall employment impact (direct and indirect) of UCHC's enterprise on the state of Connecticut in 1995 was 4,348, in 2000 it was 7,409 jobs and in 2007 was 9,452 jobs.



Government Revenue Impact of UCHC

In order to quantify the financial returns to state government, the models include a government revenue impact component, which calculates the total tax revenue generated by UCHC's operations.



Conclusions

- Based on the 2007 economic impact study findings, UCHC has a strong economic impact on the state of Connecticut economy. With an an overall economic impact of $897.4 million dollars, an overall employment impact of 9,452 jobs and a government revenue impact of $53.8 million, it is clear that UCHC is an economic engine for the state.

- Based on Tripp Umbach's modeling, John Dempsey Hospital (separated from the academic and research functions of UCHC) has a current overall economic impact of $380.1 million.

- When modeling the proposed 350 bed replacement hospital for JDH, Tripp Umbach estimates that the new hospital would have an economic impact of $625 million dollars, generate 3,250 jobs and create $38 million dollars in state government revenue. It is important to note that this is a comparison of replacing the hospital only. • This impact is

of a new 350 bed hospital and would replace the current facility which generates $380.1 million in economic impact. The difference in impact is related to the increase in size and number of employees.

- Moreover, Tripp Umbach believes that enhanced clinical facilities would increase UCHC's overall ability to generate clinical revenues, increase research and enhance medical education thereby increasing its overall impact. UCHC's overall impact has not increased between 2000 and 2007.

- Tripp Umbach does not believe that the state of Connecticut needs to own/operate the new facility but does believe that clinical operations need to be enhanced or improved at UCHC.

- Based on the AAMC economic impact analysis, which includes UCHC and its teaching affiliates, Tripp Umbach believes that further collaboration with regional hospitals to achieve excellence would also increase the impact of academic medicine within the region and state.

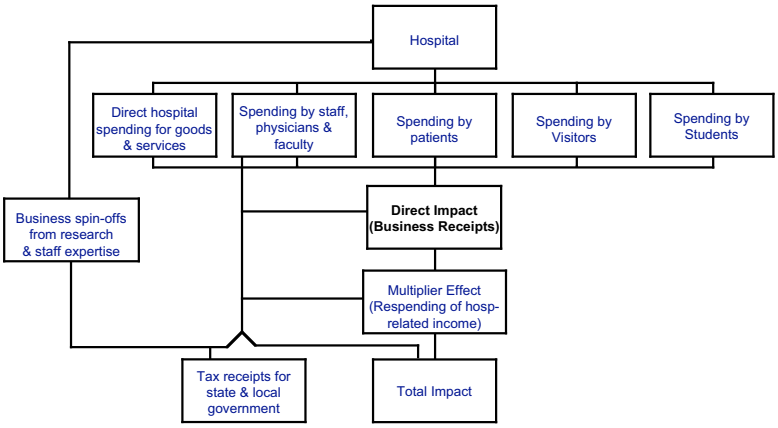
Linear Cash Flow Methodology

Tripp Umbach has performed more than 100 economic impact studies for both academic institutions, large healthcare systems and research institutions and partnerships, including the Mayo Clinic Rochester, University of Minnesota and Mayo Biotechnology Partnership, UPMC Health System, Wistar, TGen and SUNY Upstate. The methodology generally employed in these studies was originally derived from a set of research tools and techniques developed for the American Council on Education (ACE). The ACE-based methodology employs linear cash flow modeling to track the flow of institution-originated funds through a delineated spatial area. While this methodology is generally well suited to evaluate a hospital's impact on its local service area, it tends to be too limiting for a project with the complexity of a medical school with integrated systems.

Tripp Umbach recommended that the traditional model of economic impact for hospitals (see Figure 1), based on the ACE model, be modified for the purposes of this research and to match the needs of UCHC.

Figure 1:

Hospital Economic Impact
(A Traditional Model)

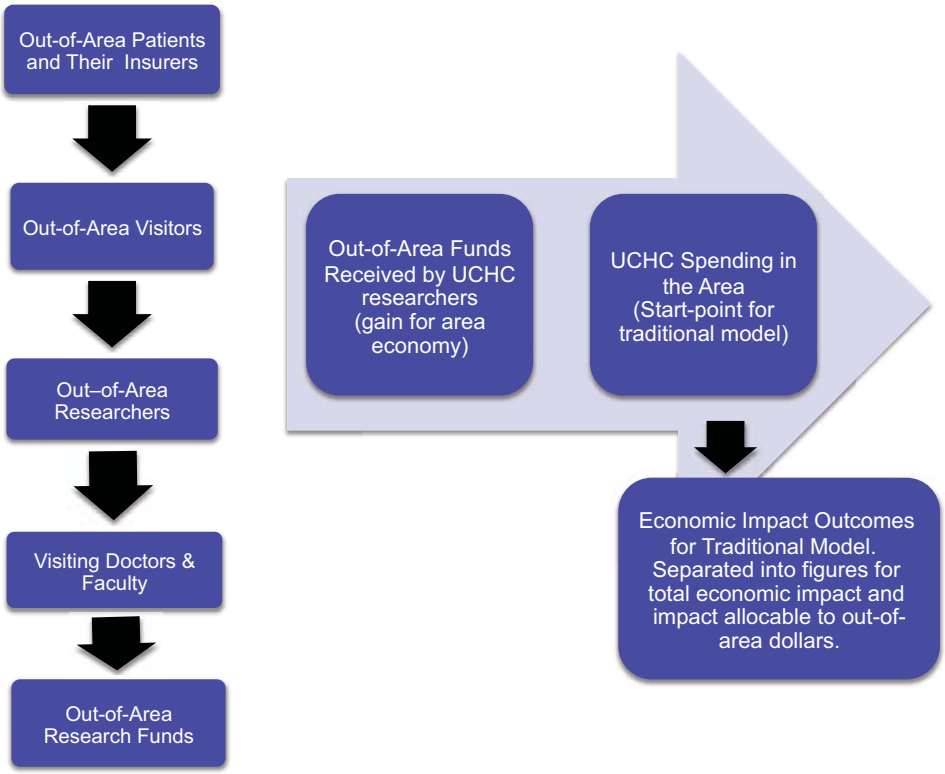


The "traditional" model of economic impact provides a good measure of the impact of expenditures and their flow within an economy. However, the model does not account for the origination of revenues, and thus counts the spending of revenues received by the hospital from in-

state sources. The traditional model counts some of the spending of dollars that already existed in the Connecticut economy.

The Tripp Umbach research team felt it important to distinguish the economic impact of the UCHC related research and collaboration that are attributable to funds brought into the state from out-of-state sources. The application of this "fresh dollar" model provides a first-line measure of the initial direct expansion in the state economy caused by UCHC. The final model concept evolved into a hybrid model including a fresh-dollar approach feeding into a traditional model which tracks in-area spending. Thus the final model used for this research (See Figure 2) measures funds brought into the study area together with the ultimate flow of these funds through the local, state or regional economy and the effect on economic expansion, job growth and enterprise development.

Figure 2: UCHC Economic Impact Model



GLOSSARY OF TERMS
TOTAL ECONOMIC IMPACT: The total economic impact of an institution includes both the direct economic impact and the indirect economic impact, generated in the economy as a result of the direct impact. Direct impact includes items such as institutional spending, employee spending, and spending by out-of-area visitors to the institution. Indirect economic impact, also known as the multiplier effect, includes the re-spending of dollars within the local economy.
DIRECT ECONOMIC IMPACT: Direct impact includes items such as institutional spending, employee spending, and spending by out-of-area visitors to the institution.
INDIRECT ECONOMIC IMPACT: Indirect economic impact, also known as the multiplier effect, includes the re-spending of dollars within the local economy.
TOTAL BUSINESS VOLUME: Total sales receipts generated within a given geographic area (state of Connecticut). Business volume includes wholesale, retail, service sector spending as well as value added in the manufacturing process.
MULTIPLIER EFFECT: The multiplier effect is the additional economic impact created as a result of the institution's direct economic impact. Local companies that provide goods and services to an institution increase their purchasing, creating a multiplier.
DIRECT GOVERNMENT REVENUE: Direct tax payments made by an institution to a unit of government.
INDIRECT GOVERNMENT REVENUE: Government revenue that is collected by governmental units in addition to those paid direct by an institution, including taxes paid directly by employees of the institution, visitors to the institution, and vendors who sell products to the institution.
DIRECT EMPLOYMENT: Total Employees based on Full-Time Equivalents (FTEs).
INDIRECT EMPLOYMENT: Indirect employment is the additional jobs created as a result of the institution's economic impact. Local companies that provide goods and services to an institution increase their number of employees as purchasing increases, creating an employment multiplier.

Appendix: A

2/20/08

TrippUmbach
research · strategy · impact

University of Connecticut School of Medicine

Student Survey (4th Year)
February 2008
Key Findings

Project Methodology

An online survey was developed in cooperation with the University of Connecticut School of Medicine, CASE Study Committee and Tripp Umbach.

The survey was distributed to all 4th year medical students for completion over a 1 week time period.

A total of 43 surveys were analyzed for the purposes of this report.

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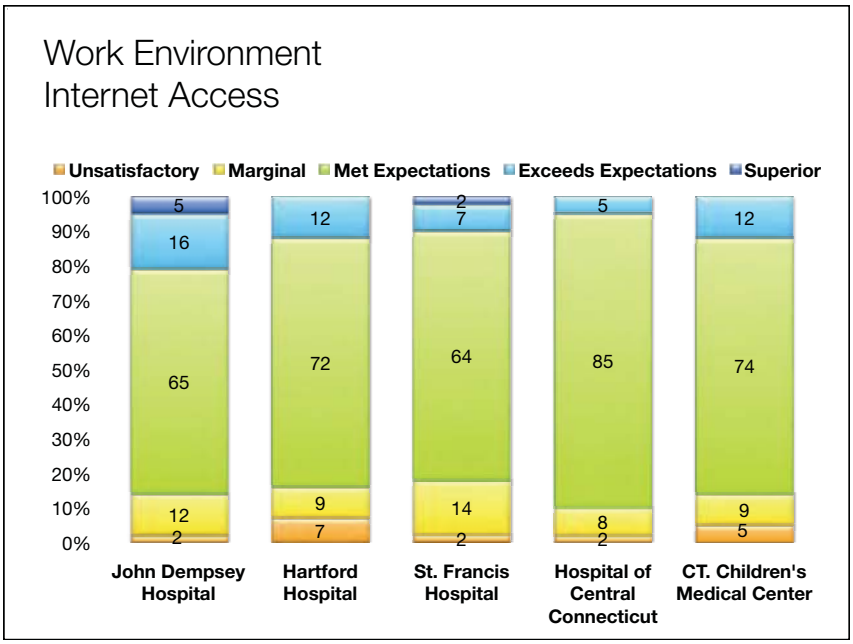
Work Environment
Internet Access
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Marginal
Met Expectations
Exceeds Expectations
Superior
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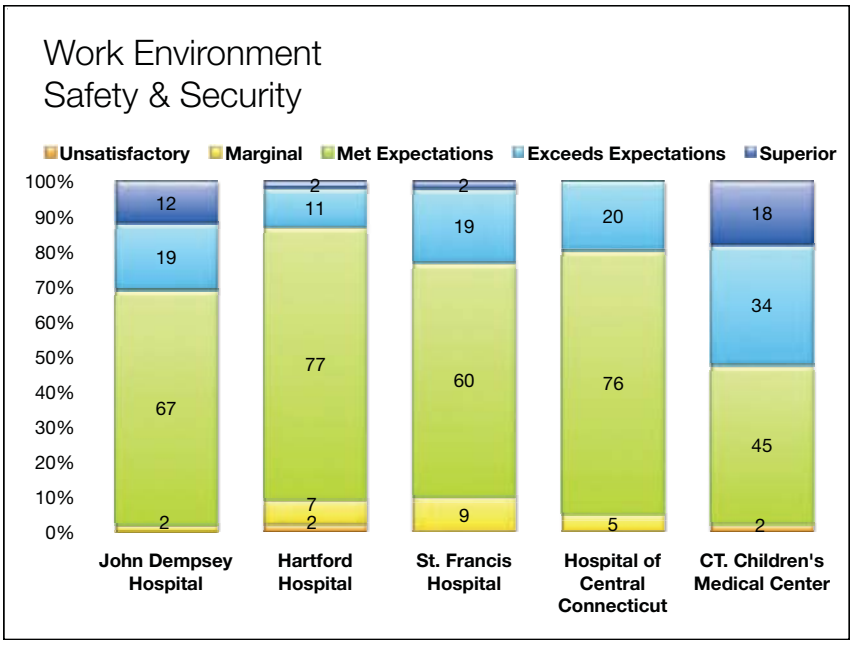
Hospital of Central Connecticut
CT. Children's Medical Center


Work Environment
Safety & Security
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St. Francis Hospital
Hospital of Central Connecticut
CT. Children's Medical Center

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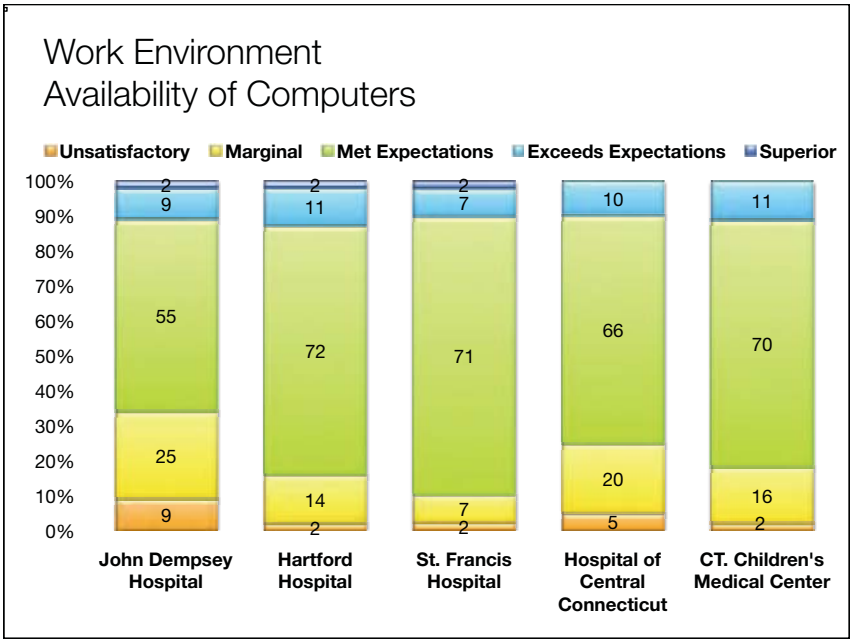
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Exceeds Expectations
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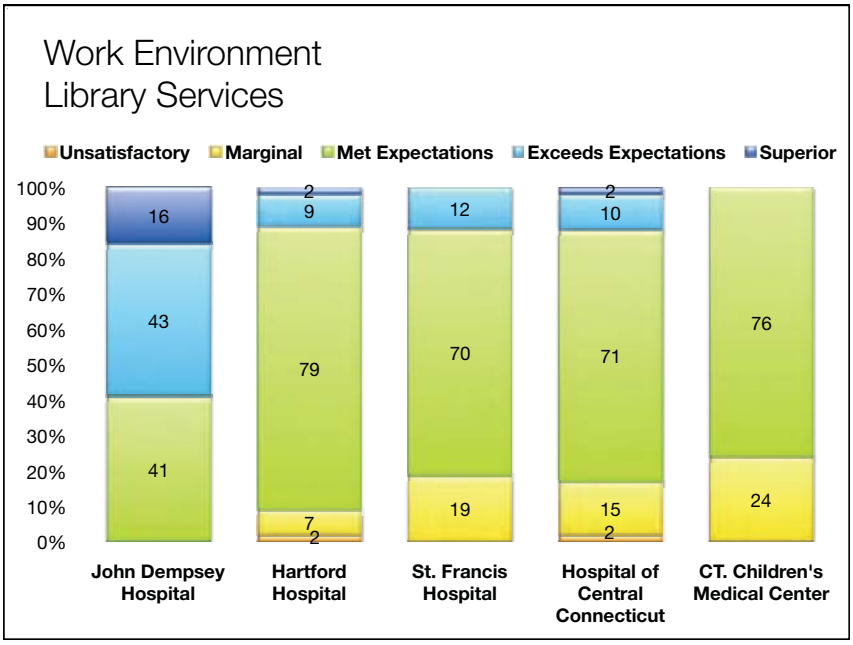
Hartford Hospital
St. Francis Hospital
Hospital of Central Connecticut
CT. Children's Medical Center


Work Environment
Library Services
Unsatisfactory
Marginal
Met Expectations
Exceeds Expectations
Superior
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John Dempsey Hospital
Hartford Hospital
St. Francis Hospital
Hospital of Central Connecticut
CT. Children's Medical Center

3

2/20/08

Work Environment
Open-Ended Responses

"The layout at St Francis and Hosp of Central CT are far too spread out for good patient care. If you get paged about a patient at the other end of the hospital, it can take a good 10-15 minutes to finish up and get over to the patient's bedside. Hartford Hosp is also spread out, but aside from the Conklin building, most patient rooms are relatively easy to get to. CCMC and JDH are very nice in that all the patient rooms are in just a few locations, right on top of one another. Very easy to get from one room to another."

"HH was not a good place in terms of being on call, as there were no call room facilities for medical students, which forces us to sleep in lounges or family rooms, not a good situation. The call rooms at CCMC are for the most part excellent, aside from the Purple team which has its facilities on the 2nd floor and patients can be as high as the 8th. The call rooms at New Britain are also decent, but once again the distance from the call rooms to the patient floors is quite a ways, especially if you get called in the middle of the night."

Work Environment
Open-Ended Responses

"The walk across to the parking garage we have to use at CCMC and HH is a bit far and feels dangerous at night. At SFH, it feels worse, because there is no patrolled garage or lot to park in, instead you have to walk along city streets at least a quarter of a mile. The parking situation at JDH is almost worse, with not enough parking available. If you don't get to the hospital at the right time of day, there may not be another parking spot available on campus, and it can take 20-30 minutes to find a place.

They did add another lot off site which has a shuttle, but if you park there, the shuttle stops running at 7 at night, and you will be forced to walk in horrid weather in the cold of night on a road without street lights. Security has refused to drive students to that lot in the past, stating it would take them at least 2 hours to find someone to do that, which is unacceptable."

4

2/20/08

Work Environment
Open-Ended Responses

"Access to Up to Date important at every site."

"Scary walking to parking garage at HH and CCMC at night."

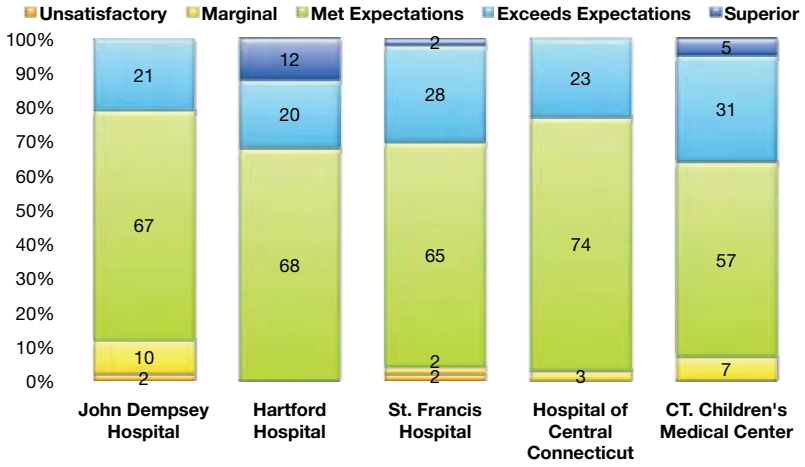
"As for safety, there were issues primarily with parking at St. Francis and HH I generally felt very safe in the hospital itself."

"Security - HH security shuttle willing to drive students to Retreat Ave garage in later hours when not as many people around. Internet access - HH and CCMC requiring Novell passwords to get to outside (non-hospital) websites can add barriers, also sometimes can be hard to find work space or computers on the floors at HH."

"Many of the affiliated hospitals restrict internet searches and resources options are limited to their electronic library."

"The structure of CCMC, Hartford, St. Francis, and Hospital of Central Connecticut is much more efficient than that at John Dempsey. The floor structure at UConn is very open, but also has a lot of un-used space. As a 4th year student, I have to work harder to find charts, nursing staff, and other patient-care resources before I ever reach the patient."

Patient Care
Patient Number



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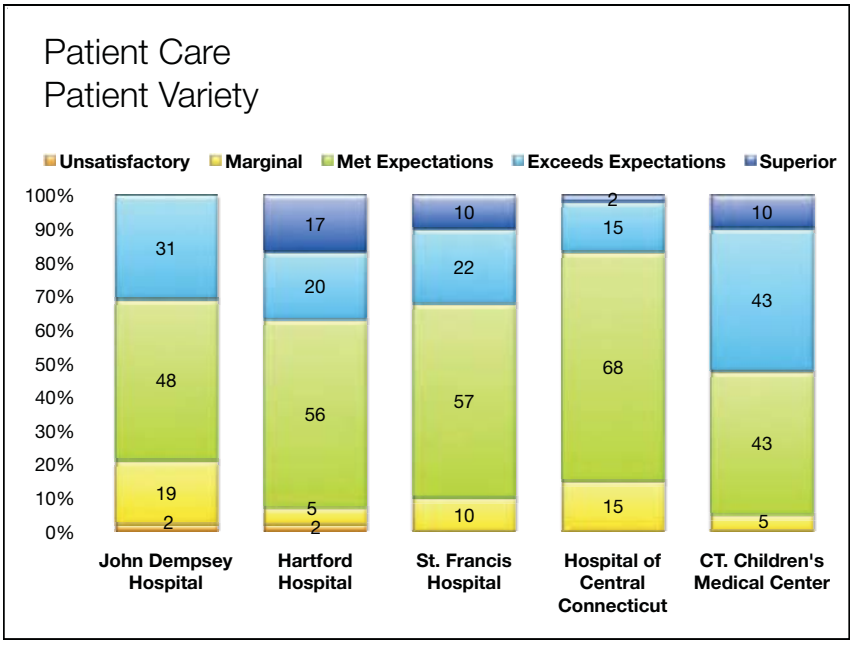
Patient Care
Patient Variety
Unsatisfactory
Marginal
Met Expectations
Exceeds Expectations
Superior
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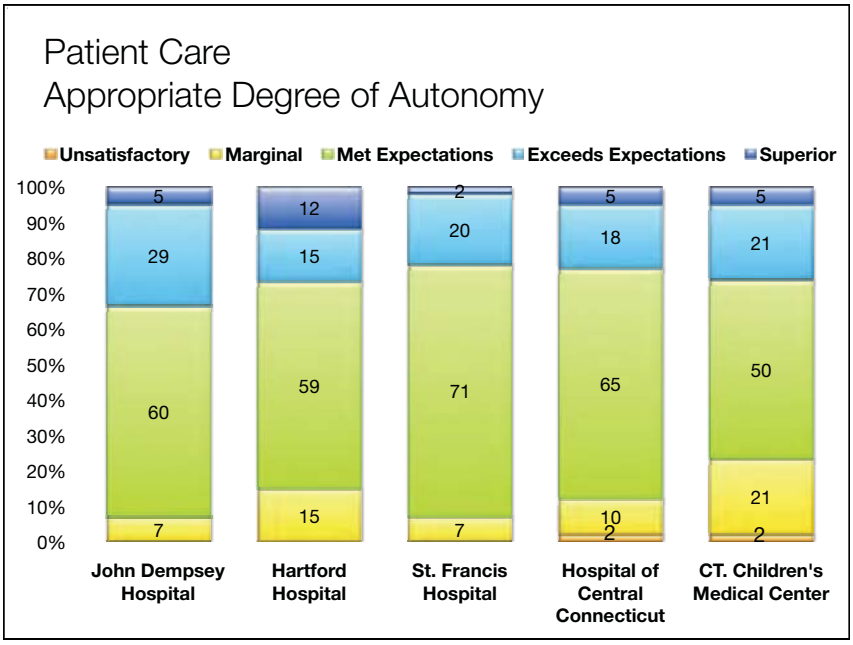
John Dempsey Hospital
Hartford Hospital
St. Francis Hospital
Hospital of Central Connecticut
CT. Children's Medical Center


Patient Care
Appropriate Degree of Autonomy
Unsatisfactory
Marginal
Met Expectations
Exceeds Expectations
Superior
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John Dempsey Hospital
Hartford Hospital
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Hospital of Central Connecticut
CT. Children's Medical Center

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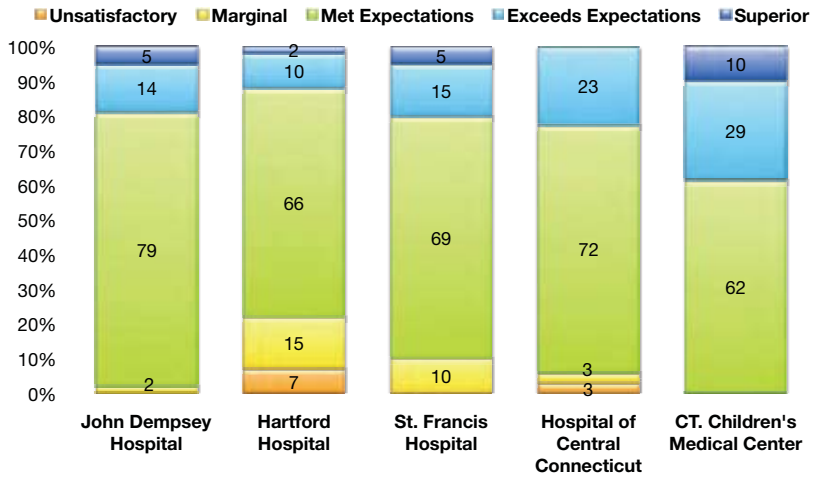
2/20/08

Patient Care
Level of Supervision



Patient Care
Open-Ended Responses

"At virtually all of the sites of the sites (aside from JDH and CCMC), we are relegated to seeing patients in the clinics. This leads to very poor patient care as we see only patients from a low socioeconomic status. There is very poor continuity of care, poor follow-up, and residents and attendings frustrated by the inherent difficulties and roadblocks in dealing with these patients. CCMC by its very nature allows students and residents to see patients from all varieties (excepting, of course, the adult variety)."

"I had minimal time at HH and only completed my outpatient surgery rotation there so I cannot answer very accurately."

"The quality of my experience at CCMC was superior. Inpatient surgery at SFH was great, mostly as a result of a number of fantastic residents and attendings."

"Ob/Gyn at HH was a great experience overall inpatient medicine at the same facility was not. I suspect the difference is due to the number of teaching attendings, general character of the residents, and number of patients carried per resident on the two services."

"Inpatient psych at JDH was unsatisfying because of the low patient census carried by my attending. At times, my resident and I shared a single patient, who quickly got sick of both of us!"

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2/20/08

Patient Care
Open-Ended Responses

"In regard to the autonomy/supervision question these factors are more course dependent than facility dependent "

"Wish I had more direct attending contact during my inpatient medicine rotation at HH."

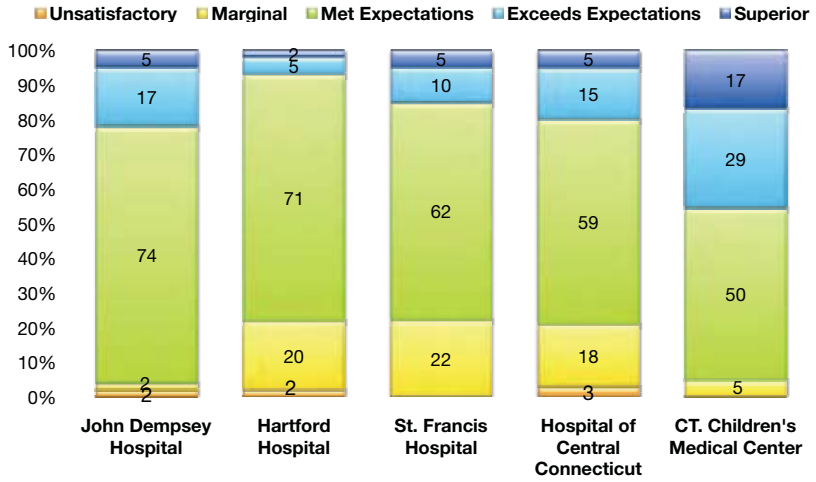
"At Hartford Hospital, our internal medicine attending did not round with the residents or me. There was very little supervision or teaching."

"Working at Hartford and JDH, the team's patient load is typically near the maximum allowed by the residency regulatory bodies. Such high numbers takes away from the time for the interns and residents to teach the medical students. The residents sometimes seem to be working "just to stay afloat" and meet the pressures of the bed managers to move patients out of the hospital. It's a little tough to learn when the hospitals are always so full and the focus is on bed turnover instead of primarily on teaching."

"These parameters are greatly affected by which rotation was located at each hospital. While I was at St. Francis for medicine, census was low and other than teaching rounds, I felt that supervision was marginal."

"The degree of autonomy and level of supervision varied at each of the facilities due to the different attendings and residents that I worked with."

Curriculum
Expectations Made Clear



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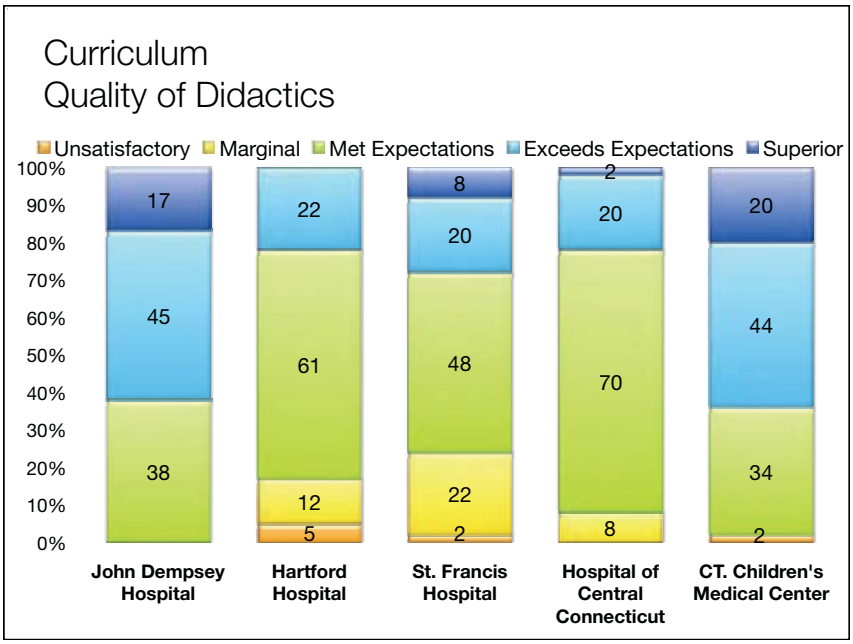
Curriculum
Quality of Didactics
Unsatisfactory
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Met Expectations
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Hartford Hospital
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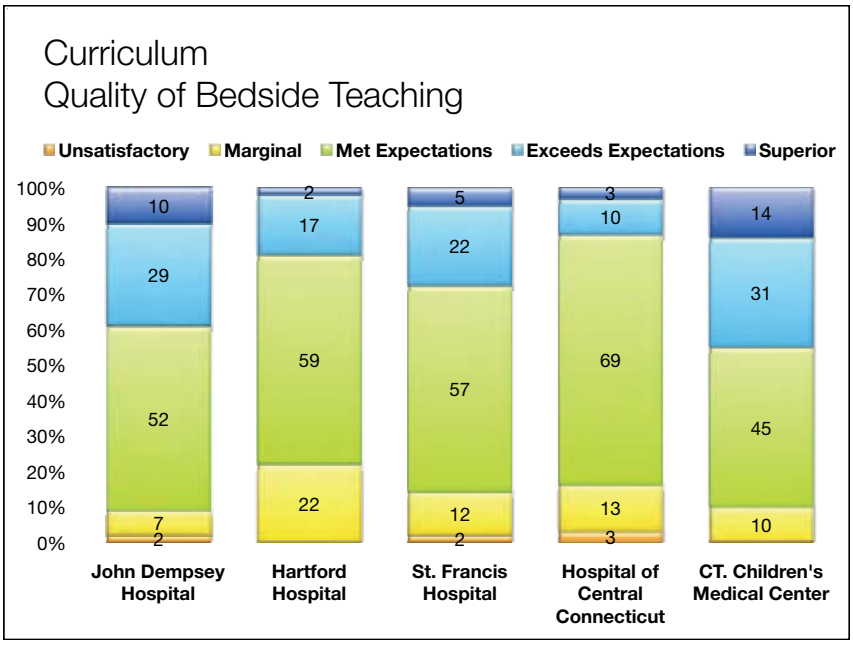
CT. Children's Medical Center


Curriculum
Quality of Bedside Teaching
Unsatisfactory
Marginal
Met Expectations
Exceeds Expectations
Superior
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John Dempsey Hospital
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CT. Children's Medical Center

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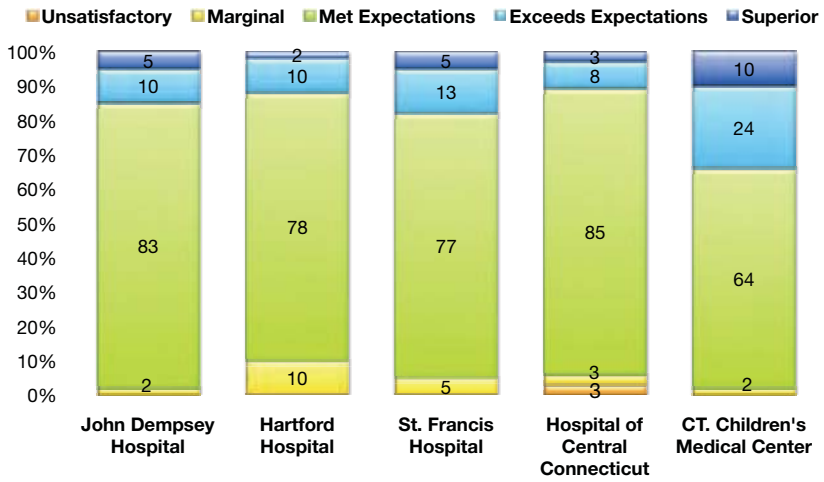
Curriculum
Experience Consistent With Curriculum



Curriculum
Experience Consistent With Curriculum

"Overall, the quality of the curriculum is consistent across the hospitals. I feel that JDH is a little better at the didactic curriculum, whereas HH and St. Francis do a better job clinically."

"Goals for surgical rotations not feasible need more hands on practice throughout curriculum (regarding procedures) I have not had enough exposure at this point."

"Wish I had more contact with my patients' attendings on my medicine rotation at HH."

"Inpatient med at HH - little teaching by attendings. something which could be improved upon."

"Hartford Hospital was more work, less learning. JDH was less work, more learning. Quality of teaching/lectures is by far the best at JDH."

"There is a variety of experiences at the CT Children's Hospital because of the tough restrictions that exist at a children's hospital. Some students have a large amount of autonomy while other students are VERY restricted and do not get a useful learning experience."

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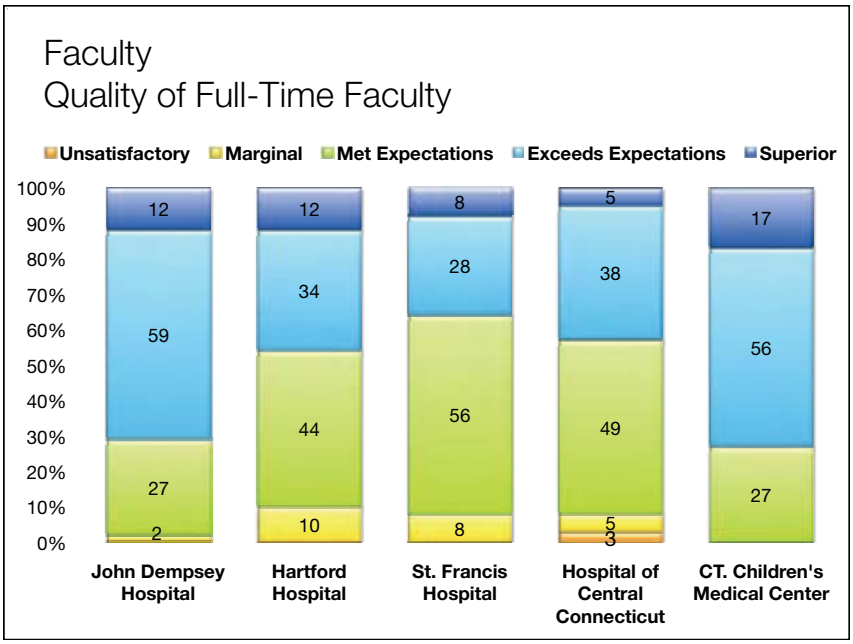
Faculty
Quality of Full-Time Faculty
Unsatisfactory
Marginal
Met Expectations
Exceeds Expectations
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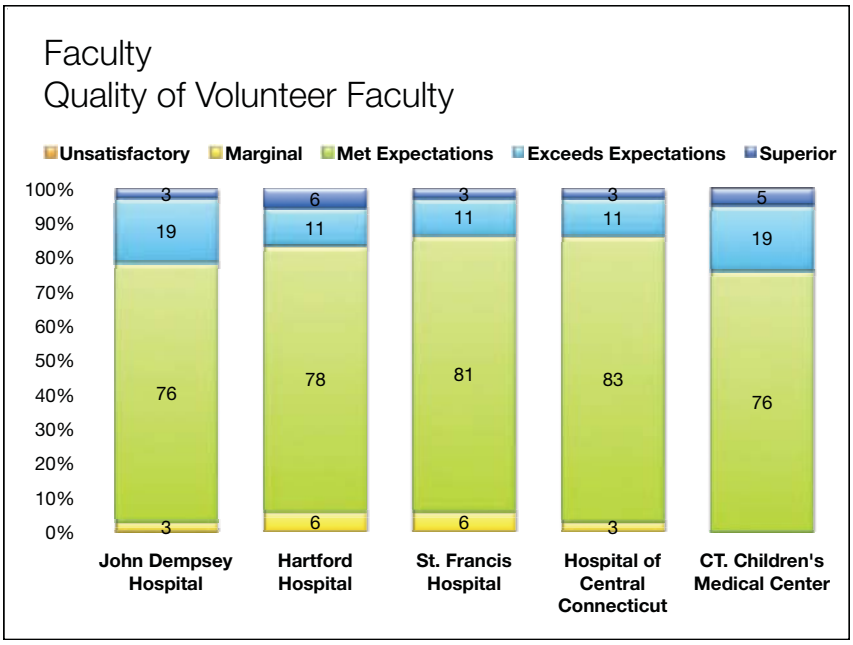
CT. Children's Medical Center


Faculty
Quality of Volunteer Faculty
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CT. Children's Medical Center

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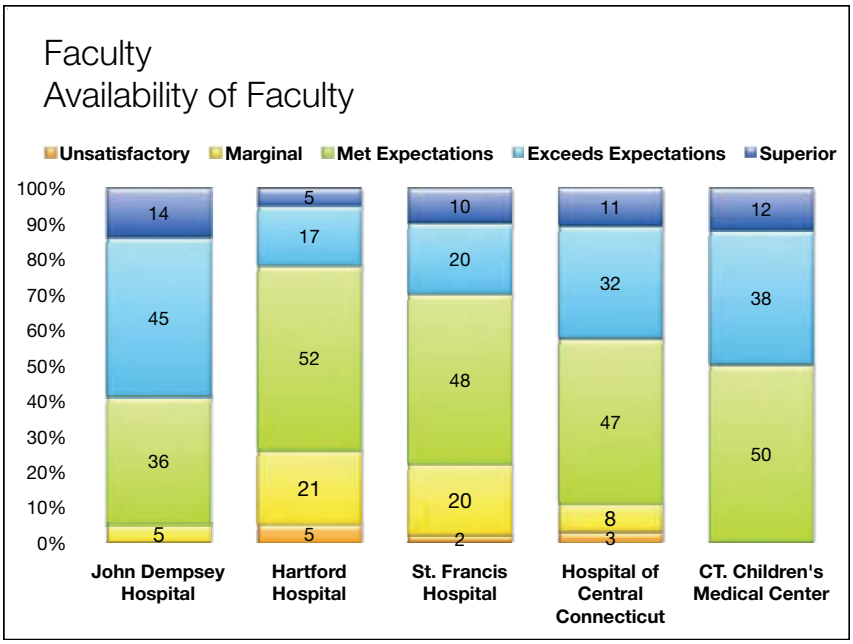
Faculty
Availability of Faculty
Unsatisfactory
Marginal
Met Expectations
Exceeds Expectations
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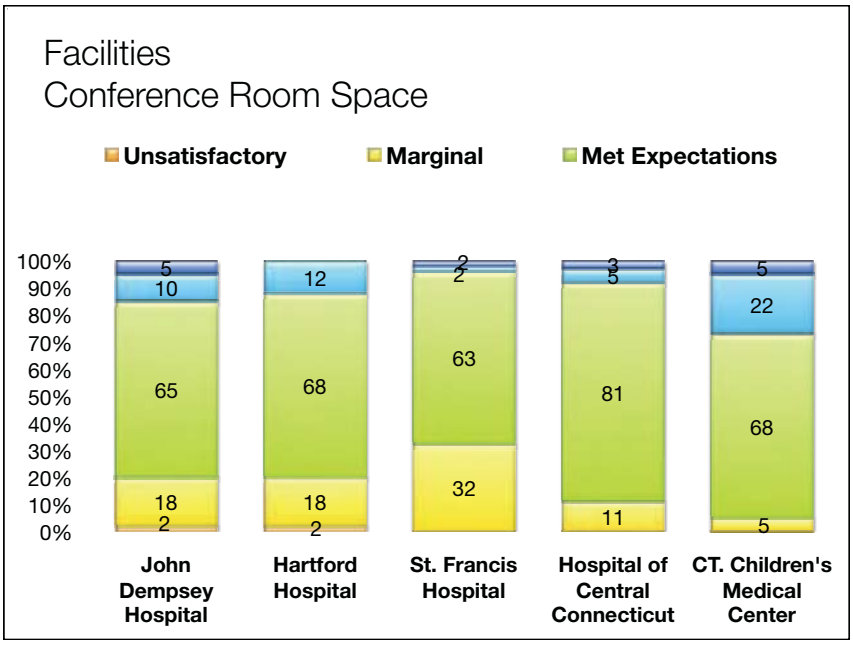
Facilities
Conference Room Space
Unsatisfactory
Marginal
Met Expectations
100%
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John Dempsey Hospital
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St. Francis Hospital
Hospital of Central Connecticut
CT. Children's Medical Center

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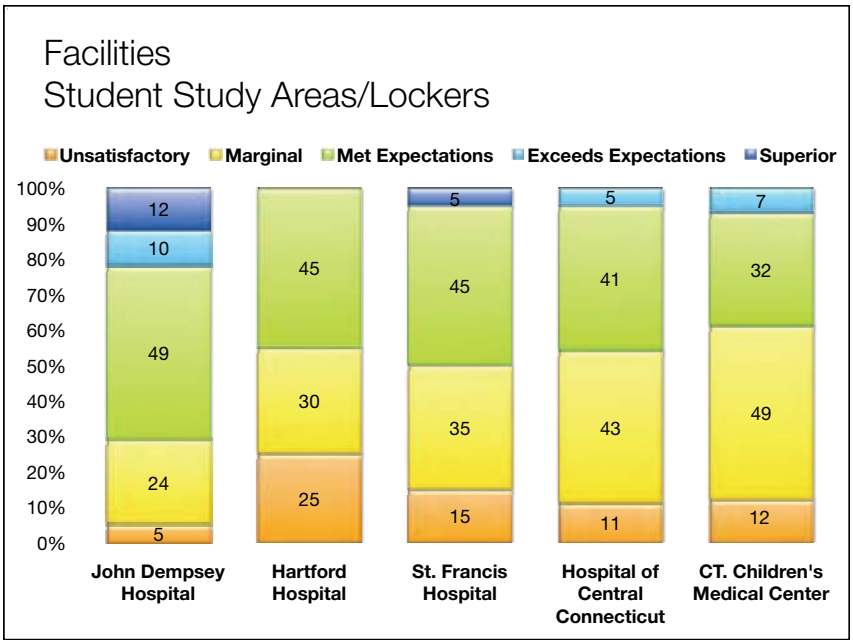
Facilities
Student Study Areas/Lockers
Unsatisfactory
Marginal
Met Expectations
Exceeds Expectations
Superior
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John Dempsey Hospital
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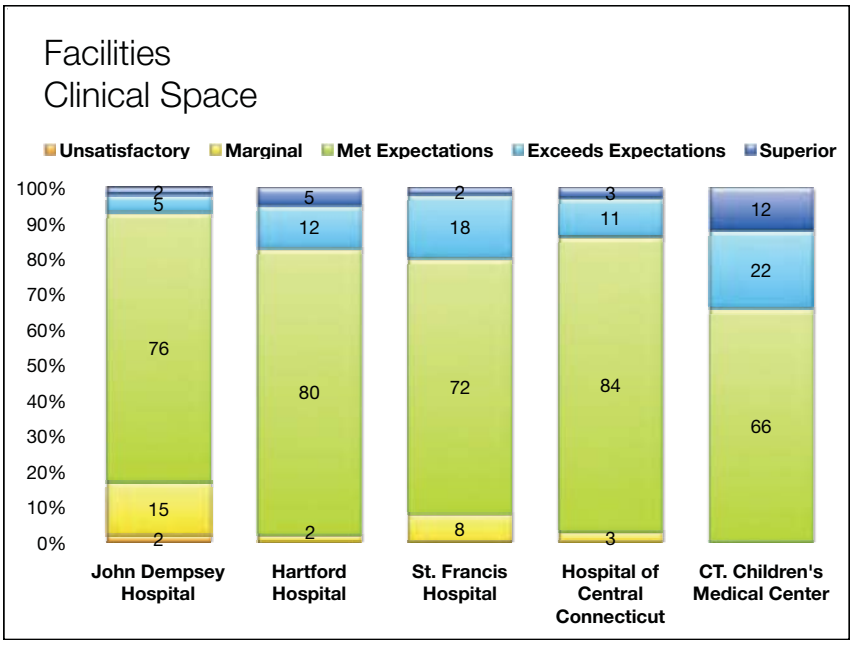
CT. Children's Medical Center


Facilities
Clinical Space
Unsatisfactory
Marginal
Met Expectations
Exceeds Expectations
Superior
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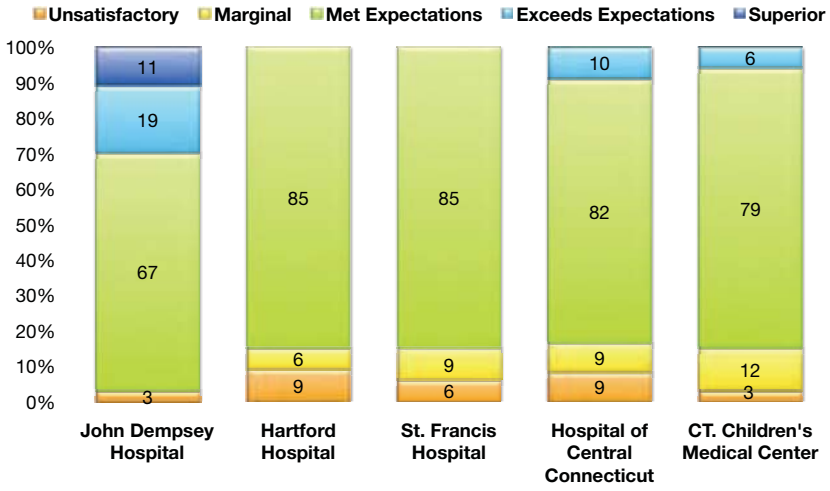
John Dempsey Hospital
Hartford Hospital
St. Francis Hospital
Hospital of Central Connecticut
CT. Children's Medical Center

13

Facilities
Research Space



Facilities
Research Space

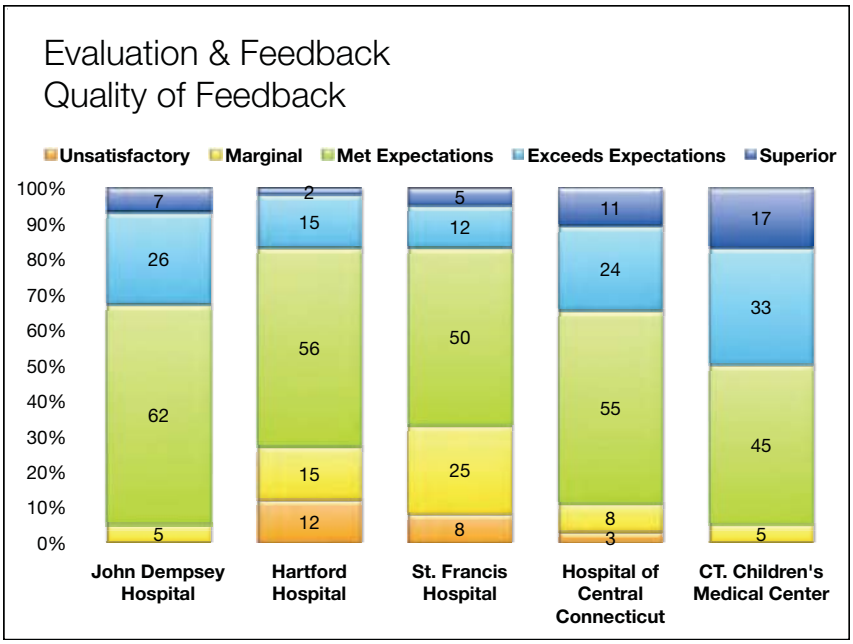
"Call rooms not available at certain facilities."

"Across the area hospitals, there is very little (and close to none) student areas or lockers."

"Students use the same area as the residents. The major issue comes with call-rooms for students staying over night. At Hartford hospital, students sleep on sofas in the resident lounge (which means ZERO ability to sleep with the residents coming in and out). St. Francis does not have enough call rooms for students in the ICU."

"Clinical space is straight forward at Hartford, St. Francis, and THOCC. UConn's clinical space appears quite out-dated, with modern technologies squeezed into place. There is little counter space to write notes, complete paperwork, or meet with teaching staff."

"I have no idea about research space. St Francis could use renovations. Carpets are not the best option for sanitation. MDLs at UConn need renovation."


Evaluation & Feedback
Quality of Feedback
Unsatisfactory
Marginal
Met Expectations
Exceeds Expectations
Superior
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90%
80%
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20%
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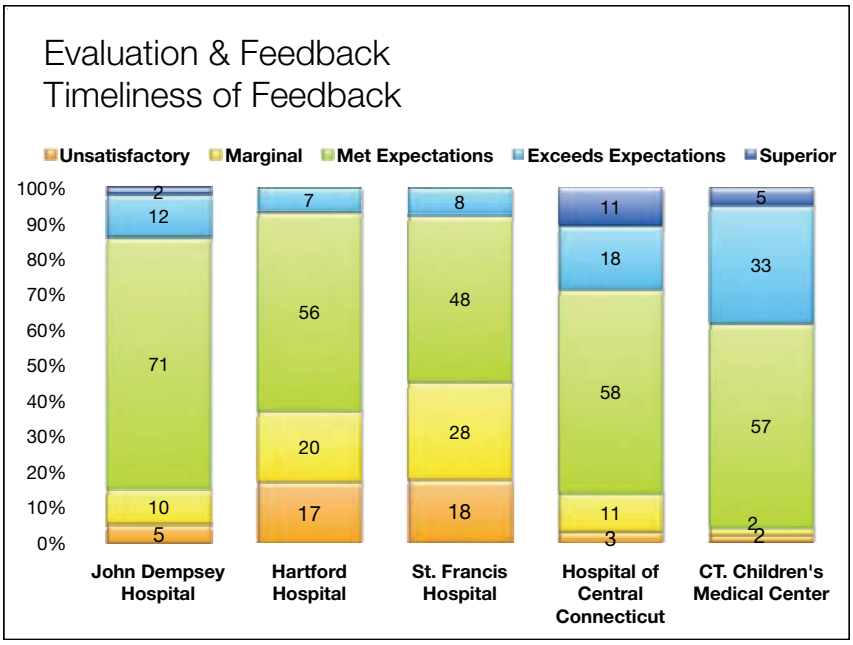
John Dempsey Hospital
Hartford Hospital
St. Francis Hospital
Hospital of Central Connecticut
CT. Children's Medical Center


Evaluation & Feedback
Timeliness of Feedback
Unsatisfactory
Marginal
Met Expectations
Exceeds Expectations
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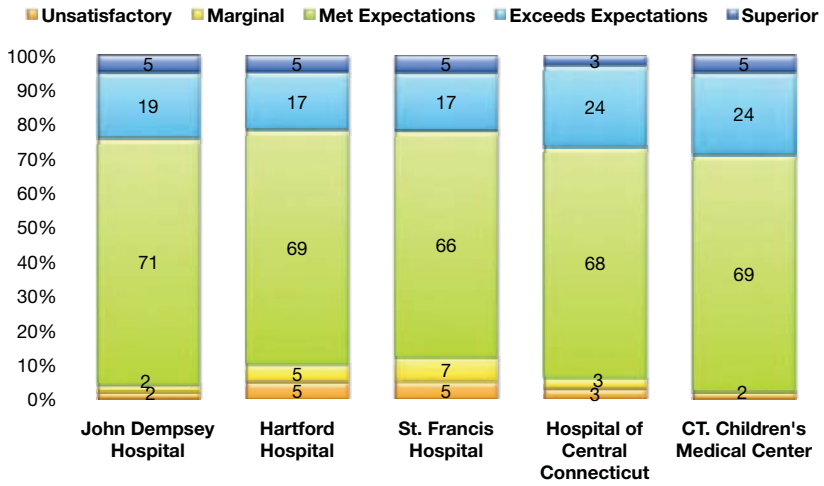
John Dempsey Hospital
Hartford Hospital
St. Francis Hospital
Hospital of Central Connecticut
CT. Children's Medical Center

Evaluation & Feedback
Opportunity to Evaluate Rotation



Evaluation & Feedback
Opportunity to Evaluate Rotation

"There are virtually no opportunities to leave feedback for the rotations during 3rd and 4th year. There is an online survey, but somehow doesn't ask the questions that we want to comment on. During the 1st and 2nd year, there was an open forum for comments after the exam blocks, but none during 3rd and 4th year, something that is truly frustrating and unacceptable and leads to poorer morale amongst students. CCMC does offer other opportunities for feedback for that location. This may be because of the caring faculty there."

"CCMC does the best job at giving and receiving feedback. There is ample opportunity to share what one sees as beneficial and not-constructive. The larger hospitals are very busy and receiving or giving feedback is more difficult, and not very efficient, but at the same time understandable."

"I received my inpatient medicine evaluation from HH some 4+ months after completing the rotation. However, feedback for the ob/gyn rotation at the same site was timely and helpful. The feedback I received at CCMC was given consistently, explicitly, and constructively."

Evaluation & Feedback
Opportunity to Evaluate Rotation

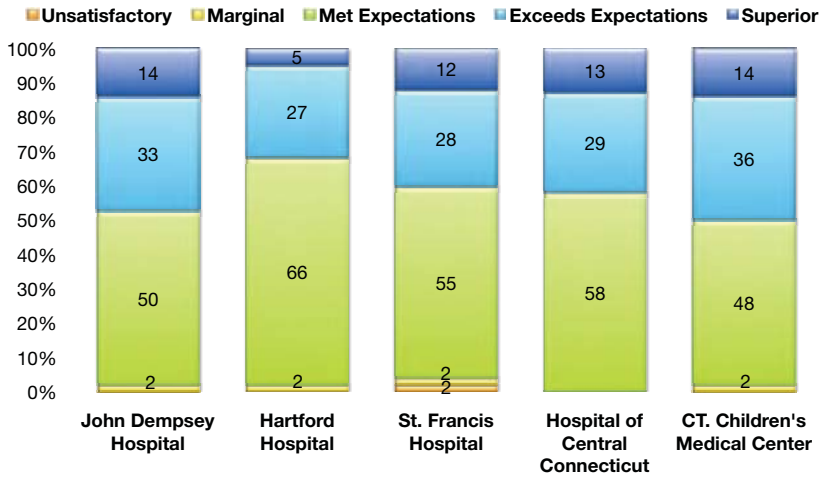
"Hard to track down attendings for feedback at HH, didn't work with them closely enough to really get feedback from them. UCHC was great for feedback because worked closely with attendings on medicine floors."

"In the clinical years, there is too much delay in the delivery of feedback. Personally, my average wait time for clinical evaluations is ~2 weeks. I received verbal feedback on the last day of each rotation, however, there have been times where the written feedback was different from the verbal comments. I'm sure you'll receive many surveys where the average wait time for feedback is >2-4 months! It's difficult to make improvements in real time with outdated feedback."

"I did not receive my evaluation for my 3rd year medicine rotation at St Francis until many many months later."

"I had to be proactive to get feedback on the rotations, but once asked, feedback was given and was very helpful."

Resident Interactions
Interactions With Other Residents



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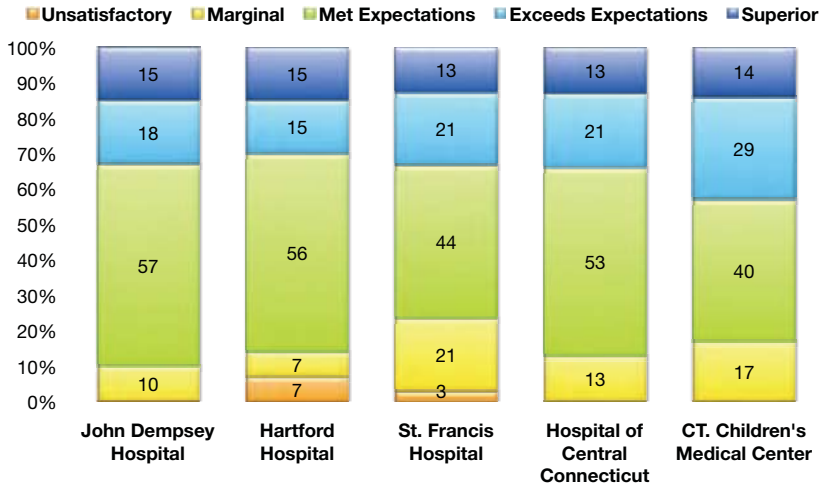
Resident Interactions
Interactions with Chief Residents



Resident Interactions
Open-Ended Responses

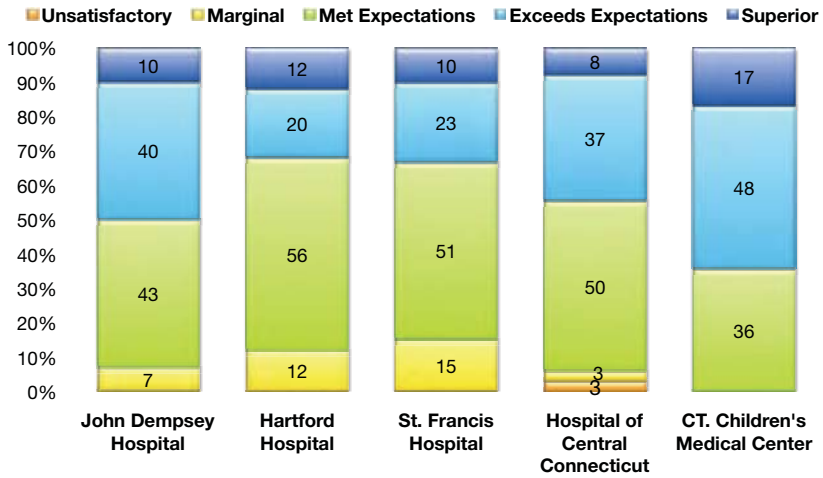
"Residents often seemed bitter and focused only on getting the work done so they could go home on time. There was very little time for education. Rounding was a purely clinical experience with no educational benefit at Hartford Hospital and Saint Francis. The patient volume was too high for each resident. Students were treated like a nuisance rather than a member of the team."

"The residents that I worked with are phenomenal, no matter where I have been located for a particular rotation. They answer questions, take time to teach, and allow the medical student to participate actively."

"Overall, chief residents were knowledgeable and approachable. Junior residents varied considerably. I was most impressed by junior residents at SFH (surgery) and HH (Ob/Gyn), as well as CCMC. In my experience, these residents cared deeply about their patients, their work, and involving students in patient care."

"All of the residents that I interacted with were fantastic with the exception of the surgical residents at St. Francis. There were two who were very unprofessional in patient interactions and had little interest in teaching peers or students. Unfortunately it gave the rotation a very bad flavor despite the other fantastic surgical residents who were part of their team."

Overall Rating
Overall Learning Environment



Overall Rating
Open-Ended Responses

"It is difficult to fairly assess these institutions based on one or two rotations per site that were each in different specialties. Overall, I would rate CCMC as a superior educational site. HH is a large, busy institution in which a less-assertive student could get lost and in which faculty and residents may not have time or energy to teach, but this is definitely not always the case. JDH has the double-edged sword of being a small institution, which means potentially more faculty attention to students but also smaller number of patients. SFH is somewhere between HH and JDH. Generally, though, I think the particular residents and faculty (and also ancillary staff!) that I worked with on a given rotation had the most impact on my experience. Faculty and residents who were welcoming and enthusiastic about teaching and involving students made for good educational experiences. Where residents (and faculty) were overstretched, overtired, or simply unenthusiastic about teaching, the rotation was much less pleasant and informative. If you are truly interested in improving medical education in the UCHC affiliated hospitals, this is where your focus should lie."

"Hartford Hospital was a good environment for learning from a large variety of experiences, not so much for didactic knowledge. UCHC was great for the didactic work and ability to work closely with the attendings, learning from discussing the cases."

2/20/08

Overall Rating
Open-Ended Responses

"I love my experiences at UConn School of Medicine. I have purposefully chosen to spend most of my clinical time at St. Francis because of my comfort with that hospital (in layout, nursing, and overall clinical services). I wish John Dempsey was more modern in layout and able to devote a little more resident/attending time to teaching instead of working at maximum capacity all the time. Because of the stresses that are present at John Dempsey, I chose to stay away because the of the difficulties to learn as much as possible."

"These are very rotation and subspecialty dependent (i.e. faculty and resident dependent): e.g. cardiology at SFH was fantastic, ED at SFH terrible. this experiences varies by students as well. this student's experience at JDH in internal medicine was poor, while another colleagues was outstanding."

"If you are proactive and ask questions, and ask to be involved, your learning environment and experiences are great!"

APPENDIX B

REMARKS OF JOHN A. DOYLE TO THE CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING REGARDING THE UNIVERSITY OF CONNECTICUT HEALTH CENTER (1974-1981)

NOVEMBER 14, 2007

Good afternoon. My name is John A. Doyle. I am a resident of Barkhamsted, Connecticut and I appear before you today to review some of the earlier history of the University of Connecticut Health Center and the John Dempsey Hospital.

My comments will largely focus on the decade, 1971 to 1981.

By of way of background, during the first part of this decade I served as Legislative Director for the late Governor Thomas J. Meskill and as the first Executive Director of the Connecticut Commission on Hospitals and Healthcare. In the latter of these years, I was Assistant Administrator at St. Joseph Hospital in Stamford, Director of the Connecticut Easter Seal Society and a member of the Board of Directors for the Connecticut Hospital Association. From 1974 to 1981, I served as a Member and later Chairman of the University of Connecticut Health Center Advisory Committee.

The history of the University of Connecticut Health Center's establishment can best be described as fractured and chaotic. Connecticut's young people were among the least likely to be accepted by then existing out-of-state medical schools. There was real and pervasive discrimination, particularly against Catholics and Jews, in hospital medical staff appointments. Emerging racial minorities and women were beginning to question when their time for an opportunity to succeed in medicine was to come. And, of course, existing clinical facilities were furiously lobbying to promote or enhance their own turf.

Numerous commissions and study groups had been formed, many consisting of very prominent educational, professional, political and civic leaders to study and to make recommendations on how a state-supported medical school might be established and where its clinical facility was to be located. Regarding the latter issue, two leading sites emerged: one adjacent to Hartford Hospital and the second, a presumably more neutral location, at Hartford's McCook Hospital. In the end—and as a great surprise to many—a hilltop site in Farmington was unexpectedly chosen by the General Assembly. It was widely accepted at the time that this

APPENDIX B (CONTINUED)

decision was the handiwork of the State Democrat Party Boss John M. Bailey whose influence with the Legislature was, and remains, legendary.

By 1971, when I became part of state government, the Health Center had taken shape in Farmington but all the heated arguments over discrimination and much of the momentum to increase access for Connecticut residents to medical education had been drowned out by scandals arising from the building of the Health Center. Rumors were heard regularly in the halls of state government that trucks containing concrete and other building materials never even stopped at the Farmington construction site but rather were diverted elsewhere to the benefit of unscrupulous contractors and the "politically connected."

At the same time, the State itself was confronted with a substantial financial shortfall and there was little sympathy from politicians who were faced with the most unpleasant task of raising taxes for an institution whose very beginnings seemed the result of "political deals" and whose construction was characterized by flagrant fraud and waste. Indeed, I can remember one senior politician referring to University of Connecticut Administration as "people whose minds have been affected by breathing for too long the thin air of the ivory towers." Other leaders such as General Assembly Public Health and Safety Committee Chairman, Dr. Morris N. Cohen of Bloomfield (who was frequently referred to as the "Father of the Health Center"), changed their primary focus from medical education and research to fighting the huge increase in healthcare costs in the provider community.

To say that the noble mission of providing the opportunity for excellence in medical, dental education and research to Connecticut's young people was subordinated in such a atmosphere would be a gross and misleading understatement. It was simply lost in discussions among Connecticut's most senior political leaders and this is, I believe, an important point for you to remember. At the very time the UConn Health Center had become a reality, very few in leadership positions in Connecticut saw it as a wonderful beginning to be celebrated to the public. It was instead, to many, an embarrassment.

My attitude toward the Health Center was, however, to become more focused. One day in 1974 while in my office at the Hospital and Healthcare Commission, I received a call from a member of the Governor's staff. He told me there was an appointment to be made by the Governor to something called the University of Connecticut Health Center Advisory Committee and that I was to be appointed. Moreover, he added, "The Governor wants you to keep an eye on what they're doing out there."

In a short time I found myself attending monthly meetings of the Advisory Committee. My fellow members included Stewart Hamilton and later John Springer of Hartford Hospital, Sr. Francis Marie Garvey of St. Francis and the irrepressible Bob Bruner of Mt. Sinai plus other Hartford area business and civic leaders. Health Center leadership was provided by Drs. John Patterson and Bob Massey, later by Dr. John DiBiaggio and the meetings' agendas served to keep the Committee appraised of significant happenings at the Health Center, including the notable progress and growth of medical education programs and clinical services. But I

APPENDIX B (CONTINUED)

came to understand that the agenda items themselves were often not the primary results of these meetings. Frequently more important was the fact that the most senior members of the Hartford medical establishment, together with concerned and involved citizens, were able to constructively discuss differences within the context of achieving excellence for the Health

Center's primary missions: education and research. Indeed, I do not remember a single instance where narrower interests or turf preservation prevailed—or for that matter were even seriously considered—over the good of the Health Center. Perhaps this recollection is tempered by the many intervening years but when I resigned as the Committee's Chairman in 1981 to accept a professional opportunity out of State, I felt I was leaving a very dedicated group of citizens who had gained an understanding of the Health Center's mission, who strongly supported that mission and who very nicely complemented the professional leadership and student body of the Medical and Dental Schools.

Today, almost 27 years later, you are faced with making recommendations regarding the Dempsey Hospital's future. I have no doubt that your fine staff has assembled the necessary facts on the Hospital history and operations. I am certain that area hospitals have and will continue to impress upon you their views of how Dempsey has affected and might affect their operations. Similarly, I am sure that the University of Connecticut will aggressively present its vision for what Dempsey could become and why.

I have a somewhat different perspective. I ask you to first and foremost answer the question that a half-century ago was lost in the din of more parochial concerns. "Should the State of Connecticut, as a matter of public policy, continue its mission of excellence in medical, dental education and research?" All else, after all, proceeds from the answer to this question and the answer could be "NO." After all, many of the original founding reasons for establishing state-supported medical and dental education have faded or passed completely into history. Discrimination, particularly that based on religion, in medical staff appointments is hopefully now behind us. Connecticut students, I suspect, are hardly now among the least likely in the nation to be accepted by out-of-state medical and dental schools. Medical school hospitals no longer need to be the clinical replacement for city- or state-operated welfare institutions such as Hartford's McCook. And indeed the State's operating and capital budgets could possibly be better used to address other pressing social issues such as general education, affordable housing or open-space preservation.

On the other hand, if the answer to this question is "YES" then it necessarily follows that the mission of "excellence in medical, dental education and research" demands necessary support in terms of personnel and facilities. And clinical facilities are an integral part of any medical and dental school's reason to exist for the same reason as the medical and dental schools themselves: to provide excellence in medical and dental education and research. Non-medical school clinical facilities do not have such as their primary mission and not surprisingly, as they exist for a different reason. As one noted physician and former hospital administrator has said:

"Removal of the medical student from the academic environment involves placement of that student in an environment governed by economic factors that deeply affect the physicians' behavior and his or her utility as a role model. This can only lead the next generation to regard

APPENDIX B (CONTINUED)

the financial aspects of medicine as more controlling than would otherwise have to be the case, and may in fact deny them the opportunity to see that, in different eras, the balance has been struck more nearly in favor of the patient."

Let me say that there certainly are perversions in today's non-system of paying for medical services that adversely affect hospitals and other providers. Payors, whether public or private sector, seek to limit their exposure by refusing to recognize true costs, by aggressively limiting the types and duration of healthcare provided and/or by attempting to cull any person who might be a bad risk. The unmet costs and the uncovered individuals cause havoc among healthcare providers and drive them to seek relief wherever else they may find it.

If excellence in medical and dental education and research are public policy priorities for the State of Connecticut, these priorities cannot and must not be compromised by the gross imperfections of payment mechanisms.

Fifty years ago, discrimination and turf protections fueled the debate on the UConn Medical Center, only to be replaced by concerns of scandals and costs. It is indeed a wonder the place was ever established much less that it has succeeded in its mission.

It is my hope that today we will not repeat this history and that your discussion will be based on what is truly necessary to maintain excellence in medical and dental education and research at the University of Connecticut.

In preparing the above remarks, I wish to acknowledge the work of Fred Hyde in his *Report to the American Federation of State, County and Municipal Employees* and to The University of Connecticut Health Center Faculty Associations; Fred Hyde, MD; Fred Hyde & Associates, Inc.; January 25, 2000, and Hedvah Lang Shuchman for "Professionalism and Political Influence: A Political History of the University of Connecticut Health Center," The George Washington University, Ph.D. 1978 Political Science, Published by University Microfilms International, Ann Arbor, MI 48106, pg. 49.

I recommend both for additional views and history on the UConn Health Center.

APPENDIX C

REMARKS BY HEDVAH L. SHUCHMAN, PHD TO THE CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING REGARDING THE UNIVERSITY OF CONNECTICUT HEALTH CENTER

DECEMBER 24, 2007

I have been asked to focus my remarks on two areas:

1. The debate between Hartford Hospital and other interest groups over the location of the Connecticut medical-dental school.
2. The decision to locate the health center in Farmington.

The pressure to build a second medical school in Connecticut, which began in 1944, came from those who argued that there were not enough places in medical schools for the number of Connecticut residents who were applying and there were large rural areas in the state underserved by physicians and dentists. It was common knowledge in the postwar period that many universities and their medical schools had quotas for the admission of Jews, Catholics and others. Restrictive policies were also common in the appointment of some hospital staffs. Those promoting a new medical and dental school in Connecticut wanted it to be a "center of excellence" and they felt that it was important, and in fact a requirement, that the public university should control the hospital associated with the medical-dental school. This group organized as the Citizens Committee for a Connecticut Medical-Dental School (the "Citizens Committee") and pressed for a new school near McCook Hospital, since this was the area of Hartford in which many indigent lived, and medical students would gain experience treating the indigent patients in McCook. There were other medical facilities nearby which would make this a campus which could focus on the elderly, and on problems of alcoholism and cancer.

Since Hartford Hospital was the only hospital in the Hartford area with a graduate program, trustees of that hospital urged that a new medical-dental center should be located on vacant land adjoining Hartford Hospital. They noted that there was a new trend in medical and dental education to focus on difficult and interesting cases. The financial burden of caring for the indigent need no longer be automatically assumed by the public medical school as a quid pro quo for access to patients for teaching purposes. Hartford Hospital did not serve indigent patients.

APPENDIX C (CONTINUED)

The sides were sharply divided, even though in the early discussions neither Mt. Sinai nor St. Francis Hospital took an official position on locating the schools at Hartford Hospital. The religious makeup of the medical staffs of these hospitals during the 1940s and 1950s was an acknowledged fact in Hartford, and it could not help but be a factor in the discussions about locating the new medical-dental school. Several influential people, including members of the Citizens Committee and legislators, stated unequivocally that the Hartford Hospital administration was "elite and restrictive" and, most important, that they doubted if Hartford Hospital would relinquish its autonomy to a university administration.

Since the only other medical schools in New England were at Harvard, Yale and the University of Vermont, there was a movement from other New England states to create a regional medical school with contributions from each of the six states. The Connecticut legislature never adopted this proposal because there was little support for this idea in Connecticut.

So concerned were the group of citizens about building a new medical center that their pressure from 1946 to 1959 resulted in eight studies about whether and where to build the school and hospital. At one point, a former Mayor of New Haven, addressing the Hartford Chamber of Commerce, said "Please don't give us another study!"

Briefly, here is the history of site selection for a medical-dental school to be built in Connecticut. During this period the legislature met biennially in odd years.

In 1947, the University of Connecticut trustees met with Hartford Hospital with the assumption that the medical school would do its instruction in the wards of that hospital.

In the 1950s, Governor Bowles' Fact Finding Commission proposed a temporary two-year, pre-clinical school of medicine in Storrs with a move towards later developing a state medical and dental center in Hartford.

In 1955, the legislature discussed a regional school administered by six states, but Connecticut representatives wanted the school in Hartford. A special session of the legislature appointed a commission composed of trustees of the University of Connecticut and the State Board of Education to investigate sites "in and near Hartford." This was actively supported by John Bailey, Chairman of the Democratic Party in Connecticut. The deputy mayor of Hartford offered 30 acres in the northwest section of Hartford, which included the city's McCook Hospital, the city-operated Home for the Aged and Homeless, the state-operated alcohol clinic, and was near Mt. Sinai Hospital and the Hebrew Home for the Aged. The city health director suggested that a medical school located in this area could become the nucleus of a research center in geriatrics, alcoholism and cancer. It was also well known by the legislature that McCook was running a $800,000 deficit and was anxious for state funding.

In 1957, the commission appointed by the legislature in 1955 reported that there were three possible tracts where the medical-dental complex could be built: land near McCook Hospital, land not far from McCook Hospital in Keney Park, given to the city under restrictive legal arrangements, and two city blocks near Hartford Hospital. However Governor Ribicoff did not include the medical-dental school in his bonding program, so the issue died in that legislative

APPENDIX C (CONTINUED)

session. Hartford Hospital was actively working for the medical school to be located at the hospital, with an exclusive affiliation between itself and the University of Connecticut. This position was strongly contested in correspondence between St. Francis Hospital and others interested in the issue.

The Citizens Committee was formed with politically connected members whose stated objectives were

- to achieve a medical-dental school
- to assure it would not be located at Hartford Hospital
- To wrest control of planning from the current University of Connecticut president

They wanted the school in Hartford and they wanted a four-year school, controlled by the university. The president of the trustees of the university preferred the Hartford Hospital site.

Hartford Hospital issued a study calling for the university to purchase the land surrounding Hartford Hospital and build the medical school on this campus. This was a declaration of war to the other city hospitals and the Citizens Committee, which wanted the school to be independent of any existing medical institutions in Hartford.

In 1960, an application was made to the Kellogg Foundation for a grant to study the feasibility of a two-year dental school and the sharing of a medical facility. The Citizens Committee thought the McCook site had several advantages, including the fact that it had the necessary roster of welfare patients, which none of the other private hospitals could offer. (At this time, medical schools could not easily include private patients in their teaching rounds.) They felt that this would be a neutral ground, neither Catholic nor Protestant. And the chairperson of the Citizens Committee made a point of saying that committee members were particularly concerned that there be no discrimination by race or religion in the new school.

In 1961, the McCook site was also recommended by the Health Facilities Planning Survey conducted by the Greater Hartford Community Council. Governor Ribicoff left Connecticut to become Secretary of Health, Education and Welfare in President Kennedy's cabinet and he was succeeded by Governor Dempsey. Governor Dempsey announced that he would include funds in his budget for a definitive study of the advisable locale, operation and financing of the medical-dental school as an adjunct of the University.

Pressure from Washington to quickly choose a site and plan for the school resulted from the February 1961 proposal by President Kennedy for an immediate program of grants to academic institutions for planning new facilities for medical and dental schools; a ten-year program of matching grants to assist in the construction, expansion and restoration of medical and dental schools to increase their capacity; and a generous program of scholarships for one-fourth of the newly entering students.

Eager to take advantage of federal aid, there were nine bills before the General Assembly by the middle of 1961 proposing studies of costs of such a school. The dispute over siting the schools between St. Francis Hospital and Hartford Hospital continued. Several members of the Citizens'

APPENDIX C (CONTINUED)

Committee circulated a rumor that Hartford Hospital, the University of Connecticut and Travelers Insurance had agreed that the school should be located at Hartford Hospital.

In the frenetic closing hours of the of the 1961 legislative session, a binding program of $2 million dollars was passed to start construction of a medical- dental school in Hartford

County. Another proposal, also passed in the closing hours of the session, called for a special Commission to select a site "in the Hartford area." Religious differences came to the fore at this time as did the economic concerns of local doctors and dentists.

In March 1962, unexpected legal and political problems relating to obtaining a clear title to the land ruled out the McCook site. Thereafter, the available options narrowed down to the VA hospital site in Newington, a state-owned chronic disease hospital, and several areas unrelated to medical facilities. There was no public discussion of these other sites. Because of the deadlines for federal aid, the process of deciding on a site became frenetic in the spring of 1962, and the commission appointed by the legislature in 1961 recommended that the state acquire a 106-acre site in Farmington which was being offered at $4000 an acre. The selection of the Farmington site created a public outcry because it was so expensive and so unexpected. At first, opposition consisted of a strong group of Hartford businessmen, political representatives and members of the Citizens' Committee. However a process of "political education" began, during which most of the strong supporters of a Hartford site made public statements in support of the Farmington site. In the course of deliberations, the commission established that the development of the schools would be on a four-year basis with a requirement for a new 400-bed university hospital. Subsequently, only the 200-bed hospital was built.

The commission did not mention how the indigent would be accommodated. Questioned in one newspaper interview, a committee member stated that they could probably get to the Farmington site by public transportation.

In February 1963, there was some effort by Hartford dentists to change the site back to Hartford, but the Hartford Dental Society was given some promises about adjunct faculty positions, after which it gave its support to the Farmington site.

In the 1963 legislative session, the dispute over the selection of the Farmington site became a political scandal. Charges and counter-charges involving John Bailey in a profit-making land deal resulted in the appointment of a bipartisan investigative committee of the legislature. No wrongdoing was uncovered. Although some residents of Farmington had mixed feelings about the site, their views did not influence the final decision.

The scandal was resolved and overshadowed by a simultaneous insurance scandal which also threatened the reputation of John Bailey.

The University of Connecticut Health Center was officially established in the 1963 legislative session, which authorized $7 million dollars for capital costs.

APPENDIX C (CONTINUED)

From 1963 to 1971, there was no legislative oversight of the medical-dental school project.

The decision by the Citizens' Committee to accept the proposal to locate the medical-dental school in Farmington was made in secret sessions of the Citizens' Committee. There were many rumors but no facts as to why the Citizens' Committee accepted the site. The chairman, who had championed a school in the Hartford area for fifteen years, was terminally ill and it was said that she feared that if the Committee opposed the Farmington site they might never get the school built.

Politics played an important role in the siting decision. John Bailey was National Chairman of the Democratic Party and he was somehow connected to the land deal for the Farmington site. During the 1960s, with the election of John F. Kennedy to the presidency, anti-Catholic bigotry was pervasive and religious differences certainly played an important role in the decision-making process. John Bailey was a master at brokering peace between ethnic ward bosses and probably had a similar role in the final decision of the location of the University of Connecticut Health Center.

The material in these comments is based on the interviews and research conducted for my dissertation: "Professionalism and Political Influence, A Political History of the University of Connecticut Health Center," submitted for a Ph.D. in Political Science to The George Washington University in February 1978.

APPENDIX D
DOCUMENTS AND PRESENTATIONS RELATED TO THE CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING STUDY CONCERNING A NEEDS-BASED ANALYSIS OF THE UCONN HEALTH CENTER FACILITIES PLAN

Copies of the following presentations are available on the Academy's website at http://www.ctcase.org/uchc/.

Please note that some files are in PDF format, some are in Powerpoint format, and some are in Microsoft Excel format.

Disclaimer: The following represent presentations and other materials provided to CASE'S Study Committee Concerning a Needs-Based Analysis of the UConn Health Center Facilities Plan for their consideration. The findings, views, opinions and recommendations in these materials are those solely of the authors and/or their respective organizations. They do not necessarily reflect the views or findings of the Study Committee or the Connecticut Academy of Science and Engineering.

Presentations to the CASE Study Committee

- Shuchman Report [12/24/07] [PDF] Provides a brief history of the development of the UCHC by Dr. Hedvah Lang Shuchman. The material in these comments is based on the interviews and research conducted for her dissertation: "Professionalism and Political Influence, A Political History of the University of Connecticut Health Center," submitted for a PhD in Political Science to The George Washington University in February 1978.
- Charlotte-Hungerford Presentation [1/3/08]
- Connecticut Children's Medical Center Presentation [12/14/07] [PDF]
- Bristol Hospital Presentation [11/29/07] (PDF)
- Middlesex Hospital Presentation [11/14/07] (PDF)
- Kaufman Strategic Advisors Regional Hospital (on behalf of Hartford Hospital, Hospital of Central Connecticut, and St. Francis Hospital) Presentation [11/14/07] (PDF)
- John Doyle Presentation – History of UCHC [11/14/07] (PDF)
- Hospital of Central Connecticut [Oct. 30, 2007] (PDF)
- Hartford Hospital [Oct. 25, 2007) (PDF)
- St. Francis Hospital [Oct. 16, 2007] (PDF)
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APPENDIX D (CONTINUED)

Additional Project Information

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- Evaluating the Impact of Supplementary Science, Technology, Engineering and Mathematics Educational Programs
- Advanced Communications Technologies
- Preparing for the Hydrogen Economy: Transportation
- Improving Winter Highway Maintenance: Case Studies for Connecticut's Consideration
- Information Technology Systems for Use in Incident Management and Work Zones
- An Evaluation of the Geotechnical Engineering and Limited Environmental Assessment of the Beverly Hills Development, New Haven, Connecticut

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- Demonstration and Evaluation of Hybrid Diesel-Electric Transit Buses
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- Agricultural Biotechnology
- Connecticut Critical Technologies

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- Evaluation of Critical Technology Centers
- Advanced Technology Center Evaluation
- Biotechnology in Connecticut

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Connecticut Academy of Science and Engineering

The Connecticut Academy is a non-profit institution patterned after the National Academy of Sciences to identify and study issues and technological advancements that are or should be of concern to the state of Connecticut. It was founded in 1976 by Special Act of the Connecticut General Assembly.

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Mission Statement

The Connecticut Academy will provide expert guidance on science and technology to the people and to the State of Connecticut, and promote its application to human welfare and economic well being.

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- Initiate activities that foster science and engineering education of the highest quality, and promote interest in science and engineering on the part of the public, especially young people.
- Provide opportunities for both specialized and interdisciplinary discourse among its own members, members of the broader technical community, and the community at large.

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