
Tom Testerman, ACHA, EDAC, NCARB
Director of Planning
HFR Design, Inc.

Kyle Kramer, FAAMA
Pinnacle Healthcare Consulting

Andrew Collignon, JD, AIA, GGP
Starting Point Health Facility Planning, LLC

James G. Easter, Jr., ACHE, FAAMA, MArch
Easter Healthcare Consulting (Ehc)
Author Bios

Tom Testerman

Tom Testerman has been active in the practice of healthcare architecture, planning, and design for 38 years. He is a certified member of the ACHA and EDAC. He has completed online coursework with eCornell and received a certificate for Healthcare Facilities Planning and Design from Cornell University. He is currently the Director of Planning for HFR Design, Inc., Brentwood, TN.

R. Kyle Kramer

Kyle Kramer is a transformational advisor with a focus on organizational strategy, physician engagement and leadership, business development, strategic partnerships, clinical operations, and performance improvement. He has over 25 years of experience in healthcare administration and is recognized as a leader in the field. He lectures nationally on issues pertaining to physician engagement and leadership as well as overall performance enhancement and process change.

Andrew Collignon

Andy Collignon is a licensed architect and attorney with 24 years of experience as a healthcare facility planner. He has worked with a broad range of clients including academic medical centers, healthcare systems, and community hospitals. His experience includes medical office planning, market assessments; service line volume projections; service line capacity analysis; operational process mapping; functional space programming; architectural facility analysis; facility master planning and preliminary architectural design. Recently, Andy has focused on creating uniform facility planning guidelines for large institutions and healthcare systems.

James G. Easter, Jr.

Jim Easter is an associate member of the AIA and an active leader in the Academy of Architecture for Health. He was founder of the Academy Journal and has served on the editorial review board since the journal’s inception. He has served as chair and co-chair of the Academy Fellowship Committee, which has awarded over 120 fellowships to graduate students in healthcare design. He has conducted over 1,200 healthcare planning engagements and most recently served as interim director of the Community Health Network (CHN) South and North Oncology Centers in the Indianapolis, IN service area.

Author Contact

Tom Testerman, ACHA, EDAC, NCARB, Director of Planning
HFR Design, Inc.
214 Centerview Drive
Brentwood, TN 37027
ttesterman@hfrdesign.com
615-370-8500 Ext/ 4412

Kyle Kramer, Vice President
Pinnacle Healthcare Consulting
9085 E. Mineral Circle, Ste. 110
Centennial, CO 80112
kkramer@askphc.com
484-320-7292

Andy Collignon
Starting Point Health Facility Planning, LLC
625 Bakers Bridge Avenue
Suite 105
Franklin, TN 37067
Andy@ACollignon.com
615-517-4000

Jim Easter, Jr., Principal
Easter Healthcare Consulting (Ehc)
518 Neilwood Drive, Ste. 1
Nashville, TN 37205
JimEaster518@comcast.net
615-424-3642
Abstract

The healthcare landscape is evolving through mergers, acquisitions, and tenuous federal legislation. The Patient Protection and Affordable Care Act (PPACA) was signed into law by the US Congress in 2010. The status of this law is changing as key components are being modified to reduce federal budget obligations. Without a back-up plan to the PPACA, these actions will continue to confuse consumers, frighten the underserved, and financially distress providers. The Certificate of Need (CON) laws and the Critical Access Hospital (CAH) programs in tandem with the Federally Qualified Health Clinics (FQHC) remain in flux without strategic vision, budgetary compliance, and continuity of effort. Cuts in reimbursement, insurance premiums, and the elimination of programs supporting underserved populations continue. The greatest impact occurs in the chronic disease, senior care, mentally ill, substance abuse, and emergency care arenas. Herein resides the future opportunities for healthcare planners and architects. Methods to improve the delivery processes and growth in demand continue with the roll out of free standing emergency departments (FSED), urgent care centers, and satellite micro hospitals (all these are efforts by developers and providers to improve access, reduce cost and gain market share). Reductions in hospital stays and recidivism continue to aid in cost reductions. This paper explores four key sectors of these market dynamics:

1. Mergers and Acquisitions
2. Realistic Needs Assessment
3. Emerging Models of Care
4. Consumer Expectations

Traditional planning will be redefined in light of these factors and the need for collaboration between industry experts working in partnership with the client to change processes, adjust operations, and A/E design solutions. We are witnessing how this disruption can be harnessed and directed toward improving the delivery of care while reducing fear, risk aversion, and “analysis paralysis” from numerous perspectives. Without vision with action, we lose our ability to change these external forces. To be effective, a methodology for owner-driven collaboration is required. The architecture of the future will be informed primarily by defining the strategies of service integration, population health, partnerships, and action-oriented service. This new service model will embrace a mutually beneficial philosophy of vision plus asset and operational planning. Capital dollars will be measured over time to demonstrate the optimum ROI and added value to the consumer. The recommendations will need to be feasible, flexible, sustainable, and transformable.

Keywords:

1. healthcare systems
2. healthcare architecture
3. healthcare planning
Introduction

The healthcare landscape is evolving through mergers and acquisitions. We believe there is a need to expedite the decision-making process, and shift the problem-solving methodology from a traditionally linear approach to a parallel effort that combines master planning (MP) plus process change. Our vision is illustrated in Figure 1 herein. This paper addresses the following areas:

1. Mergers and Acquisitions
2. Realistic Needs Assessment
3. Emerging Models of Care
4. Consumer Expectations

Figure 1 – Vision For Planning

Many rural providers of care are struggling with older buildings needing repair and technological change. This dilemma exists within systems as well with many recent acquisitions having placed the new owners at financial risk due to facilities that are obsolete and in need of upgrades. Dollars to upgrade and/or replace obsolete facilities remain hard to obtain (Testerman et al., 2017). Cost of care management is shifting from reimbursement based on the site of care to reimbursement based on the clinical condition and patient need at time of encounter. Site
neutrality has been debated and even advocated by MedPAC, with an emphasis on ambulatory care alternatives, specific post-acute care settings for select diagnostic-related groups (DRGs). The accountable care organizations (ACOs) were intended to link payments to quality metrics and the overall cost of care. According to the Centers for Medicare and Medicaid (CMS), ACOs are “an organization of healthcare practitioners that agree to be accountable for the quality, cost, and the overall care of the CMS beneficiaries who are enrolled in the traditional fee-for-service program and who are assigned to that ACO” (CMS/Medicare ACO Shared Savings, 2018).

Examples of creative staffing and operational change are found in the Planetree and Greenhouse programs (Easter, 2011). Traditionally, care settings have been defined by reimbursement factors (most profitable), which is not the optimum approach. Our vision is a change in operations to encourage a seamless flow of patients from acute to post-acute care and expanded system-wide partnerships for acute care and senior care within communities. Managed care payers have the flexibility to enter into creative care delivery models that remove traditional labels on care sites. The clarity of the Patient Handling and Movement Systems (PHAMA) narrative will aid in this process improvement (The Facility Guidelines Institute, 2014).

1. Mergers and Acquisitions

Further altering the healthcare landscape is strategic growth through mergers and acquisitions occurring within the not-for-profit (NFP) and for-profit (FP) sectors of healthcare delivery. Some FP systems are finding their purchases are not profitable and they are selling to NFP providers. This trend has accelerated with the employment of physicians and the expansion of specialty physician management arrangements. The targeted service lines are the higher revenue generating programs; for example; heart/cardiovascular, orthopedic and oncology to mention a few.

The concept of strategic growth through mergers is not new to healthcare but these efforts are leading to the creation of mega-systems and the demands for asset re-alignment. Often described as a spoke and wheel concept, examples include; Ascension Health, Mercy/Bon Secours, Geisinger, Baptist Health and The Carolinas System. The systems listed in the American Hospital Association (AHA) membership directory includes hundreds of programs that have affiliated on a national level. (AHA Membership Guide, 2017). These entities are designed to create economies of scale, reduce operating costs through best practices, and remove unnecessary variation through process improvement.

Measuring the results of each enhancement is key to effective outcomes and the creative linkages of process changes to innovative planning and design. We encourage the following:

1. Addressing process improvement in tandem with functional planning;

2. Master planning and programming that involves the staff, process experts, and design consultants continuously;

3. Confirming the value of form, function, economy, and time with improved service delivery methods and staffing changes;
4. Adding process and operational curricula to architectural and healthcare administrative programs focused on the design of healthcare facilities;

5. Conducting case-based studies involving architects, engineers, and planners to work in partnership to address improved concepts, programming methods, and process improvements that are readily measurable using computerized simulation and integrated project delivery (IPD) as well as building information modeling (BIM).


Often lost in the race to grow operationally is an understanding of the impact of functional changes on the physicians and the medical practices that are most critical to the care. Introducing new and returning patients to service lines of these merged organizations is a challenge. Streamlined and efficient portals of entry, and overall patient access remain a high priority. This is both systemic way-finding and functional accessibility based on primary, secondary and tertiary levels of care (see Figure 2). Referral relationships can be delicate and influenced by institutional actions and conditioned behaviors.

This underscores the need for staff leadership and involvement in these types of considerations, especially when service delivery decisions may be based upon geography and/or perceived institutional capabilities at one location compared to another. The other variable in this accessibility equation is patient management by employed physicians who are incentivized to treat patients on a relative value unit (RVU) basis which encourages maximum throughput of patients and maximum efficiency of staff time. This often impacts the physician and patient relationship but is improving with an understanding that patient and physician communications are key to overall service delivery.

Figure 2 - TN MAP of P, S, T Zones

“Regional and Statewide Healthcare Planning Can Respond to All Human Service Needs When Managed Carefully and Implemented Comprehensively”.

Healthcare Should Have No Boundaries to Access.
When contemplating alignment with another organization, all parties are well served by having a robust team of professionals involved in evaluating the strategic direction and including physicians who know the pulse of their referring community. However, a less favorable reaction from referring physicians and patients shouldn’t dissuade organizations from considering market expansion. The inclusion of a community health needs assessment (CHNA), a component of the ACA, can provide this relevant planning information and help identify service gaps. Collaboration may obviate incorrect perceptions and enable all parties to approach the market solutions proactively (see Figure 3).

Figure 3 – CHNA Components

2. Realistic Needs Assessment

Patient Volume Trends and Key Planning Units (KPU)

The need for flexible healthcare facility planning increases with market uncertainty and consumer demographics. The more uncertain the market, the more planning is required to insure confidence in decisions and effective integration of resources. There are three key dynamics in healthcare facility planning: 1) quantifying market volumes (by service, provider, and need) and factors affecting those markets; 2) projecting future patient volumes/usage and market share by providers in the market; and 3) determining an appropriate facility capacity and type to accommodate future patient volumes.

Market Analysis

Data to quantify market volumes are available commercially from many sources and should include population demographics and healthcare-specific details, such as market discharges and average length of stay (ALOS). The Advisory Board Company and Stratasan are two examples of companies that provide current and reliable data. Some states track
historic data for their populations and this can be obtained through the statewide planning offices or within the offices of the Certificate of Need (CON). This information is used to accurately establish a healthcare provider’s current market share and create trending analyses that indicate future demands. This is known as a gap analysis in that service delivery voids and regional needs are often discovered at this phase of planning. This 30,000-foot view combines with Google Earth and GPS programs to clarify regional status. Usage rates by provider should also be considered in a market analysis. Changing population demographics have a significant impact on use, for example: senior populations use more healthcare services and the 70+ demographic is projected to grow to 80 plus million by 2050 (Ortman, Velkoff, Hogan, 2014).

Competition is a significant factor in market analysis. Many facilities are seeing their emergency department volumes drop when free-standing emergency departments (FSED) open in their markets.

**Projecting Future Patient Volumes**

This step in the planning process depends on the service lines and two universal drivers: physician availability and patient volume. Following the purchase of a major specialty group, member physicians were encouraged to send their patients to the new hospital location. When the physicians are salaried, the ability to impact patient flow is less complicated than within groups that are not employed by the provider. One must be cautious to comply with Stark Laws intended to influence the referral patterns of patient populations and to avoid the conflicts of self-referral by physicians to a location where there is a personal or family financial relationship. Physician influence by referral remains a major factor in market analysis and ethical responses.

**Capacity Analysis**

Key planning units (KPUs) are space drivers within a healthcare facility where patient care, treatment, and testing occur; for example, inpatient bed allocations and imaging. These “Key” rooms drive the need for most other ancillary and support functions (utility, linen, staff support, technology, transport, etc.).

A capacity analysis can determine the number of KPUs required to accommodate service line patient volumes given certain operational parameters (average length of stay, average case time, etc.). Examples of variables considered in a capacity analysis include target occupancy rates for inpatient beds, average length of stay (ALOS) for different types of emergency department (ED) patients, average case times for different surgical service lines, room turn times for diagnostic imaging and C-sections for obstetrics.

Service line operational models affect capacity requirements. For example, in an emergency department, new patient flow models are incorporating mid-level providers in the triage area. This is referred to as the rapid assessment unit (RAU). After the Emergency Medical Treatment and Active Labor Act (EMTALA) requirements are met, this process allows low-acuity patients to be diverted, demonstrating the process change and reduction in variation. As noted, patients do not wait; they are immediately received, triaged, assessed by Emergency Severity Index (ESI) level of care, and moved into a procedure or holding area. Frequently test results are required and patients are held in procedural or
less intensive, but friendly lounge spaces, before discharge or admission. Urgent or moderately ill patients, or those with a history of ED overuse, are transferred or discharged. The advancements of RAU and discharge and the no waiting concept developed by Warden and Taniguchi as described in their publication; “Integrated Program for ED Crowding, Combining a “High Capacity Unit with ED Case Management”, published in Garden State Focus, national excellence award winner, 2011.

3. Emerging Models of Care

Healthcare is no longer framing planning as an evolutionary process but as a revolutionary one, driven by innovations in technology, payment reform, value-based care, population health, consumerism, and risk management. To achieve the visionary outlook and economies of scale with increasing margins requires thought leadership from a wide swath of expertise: legal, real estate, finance/funding, insurance, regulatory/codes, architecture, engineering, and construction. Managing these professionals and their interface within the overall master planning (MP) is the challenge.

The Internet of Things (IoT) is the driving force behind technology, with mHealth, eHealth, and eTechnologies requiring connectivity through network infrastructure. Medicare payment reform is revealing emerging payment models that include value, quality, and affordability and include the Medicare Access and CHIP Reauthorization Act (MACRA), merit-based incentive pay systems (MIPS), and alternative payment models (APM). (See Figure 4)

Figure 4 – Internet of Things

The basis of these programs resides in clinically integrated care that emphasizes convenience, access, and affordability in tandem with economies of scale. Each of these programs introduces value-based and bundled payment systems emphasizing integrated and coordinated care leading to lower costs, secure data, and improved outcomes. Planners and A/E must understand the interface of cost, resource availability, systems, and time to effectively adjust the facility MP and process improvements.
How does an organization structure the planning process around these imperatives in order to facilitate a culture that supports change? Again, we refer to the ED and urgent care programs as cases in point. Within the typical acute care hospital, over 30+ service areas and departmental areas require this awareness. We define these core services by planning groups: inpatient care, outpatient services, diagnostics and treatment, support/supply chain, office and administrative, and infrastructure/mechanical support. Identifying these core building blocks is the start of effective master planning (MP). See Figure No. 5

**Figure 5 – Services**

**COMPREHENSIVE HEALTHCARE PLANNING**

**LEVELS OF PROGRAMMING**

- **TIER 1 - SYSTEM**
  - Mergers/Acquisitions/Affiliations
  - Centers of Excellence
  - Referral Networks
  - Access Points
  - Consolidations/Realignment
  - Satellite Facilities

- **TIER 2 - CAMPUS**
  - Development Roadmap
  - Opportunities/Constraints
  - Highest Use
  - Current/Projected Space Needs
  - Conceptual (Order of Magnitude) Budgeting
  - Site/Facility/Infrastructure

- **TIER 3 - FACILITY**
  - Building Design
  - Renovation/Repurposing
  - New Construction
  - Demolition

- **TIER 4 – DEPARTMENTAL**
  - Service Line/Capacity Analysis
  - Integration/Realignment
  - Expansion/Contraction

The correlation of these zones to the functional departments as well as their locations, size, and geographic boundaries are referred to as master zoning (MZ) in the planning context (see Figure 6). Using simulation to ascertain existing sizes, interface those listings with scaled floor plans, and prepare updated space listings that demonstrate size and functional change are key attributes of effective MP development. As the changes evolve, so do the projected total area requirements in net, departmental, and gross square feet. These listings are linked to construction and project budget sheets depicting the size, grossing factors, and total budgetary costs, including the construction categories and the supportive soft costs of fees, contingencies, allowances, land costs, and inflation.
COMPREHENSIVE HEALTHCARE PLANNING

FUNCTIONAL PROGRAMMING

• DEFINITIONAL CRITERIA
• PROGRAM NARRATIVE
• OPPORTUNITIES/CONSTRAINTS
• BUDGET PARAMETERS
• GOALS/OBJECTIVES/NEEDS
• STRATEGIC INITIATIVES

4. Consumer Expectations

The healthcare client expects a timely and accurate response. In the planning of capital assets, this expectation requires preparation, which includes assembling team members from various disciplines within the client’s organization and external advisors qualified to join the team. This two-way street is led by the planning consultant in partnership with the client and requires an understanding of this multi-faceted challenge. First, the problem-solving process requires asking the correct questions, understanding the situation, and the client. Secondly, the users have a stake in the process. Third, the infrastructure aspects of the problem remain a very high priority given the impact of mechanical, plumbing, electrical and IT systems on the overall environment (King et al., 2018).

Hospital user groups, empowered by the A/E/P, become aware and supportive of the entire process. The most reliable solutions to capital asset challenges are as follows:

- A clear and accurate understanding of the problem and the client which:
  - summarizes goals and objectives (new versus renovation and/or process change versus immediate compliance),
  - identifies building, technology, systems and process priorities, and
  - assesses small or large challenges (one department or many)
• A workable master plan (MP) to address the problem, goals/objectives which:

  o occurs routinely, at least every 3 years,
  
o involves the planner, architect, and engineer,
  
o addresses the context of the situation (in-house capabilities and resources),
  
o reflects the value of a functional program (function, form, economy, time),
  
o identifies the problem and context of the project or system-wide projects, and
  
o summarizes existing conditions, environmental status, and patient-centered needs and functions.

• User Involvement in the analysis, synthesis and evaluation which:

  o provides information on assembly of service line volumes and trends, and
  
o achieves consensus on priorities by service lines and trends.

• Proper team structure within a reasonable consultation fee as a means of:

  o achieving the most effective team for the engagement budget, and
  
o demonstrating experiences motivated by client and patient needs.

• A willing client, eager to address the issues candidly and collaboratively who:

  o embraces a transparent process,
  
o agrees with an approach that dictates that form follows function, follows funding, and follows strategy and risk, and
  
o participates in a collaborative assessment of the full continuum of care as described in the article on CEO imperatives for healthcare transformation. (Chatfield et al., 2018)

Conclusion

Evolving from hospital needs to multi-hospital sites and integrated delivery systems offers a new and expanded scope of effort. The challenge is to study numerous sites within select markets combined with the diverse types of existing facilities, while anticipating transition to an integrated delivery system that must consolidate and streamline access and reduce
capacity. The responses to new organizational structures combined with appropriate metrics to measure the assumptions and applicable outcomes remain the challenge. In summary, the successful engagement requires a parallel service delivery partnership between facility planner/architect/engineer and owner. The partnership is based on each client’s resource base, level of awareness, and technological preparedness. To accomplish a successful MP for the future, one must align all available resources with available assets, and human resources. Where the service delivery gaps exist, the successful consultant provides the information required to augment those needs and complete the engagement within a reasonable timeframe. To communicate this effectively, the following suggestions seem pertinent:

1. Understand the system-wide implications of planning efforts:
   a. Assess client strengths, weaknesses, and opportunities;
   b. Assess strategic objectives and return on investment;
   c. Assess competition and consumer expectations;
   d. Interact With An Evolving Organizational Structures;

2. Address the market needs, service gaps, and longer-term factors;

3. Share benchmarks from similar systems and service delivery programs;

4. Define capital asset priorities, constraints, and expectations (King et al., 2018)

5. Gather relevant facility data by site and building; compare and contrast image, impression, and environmental attributes;

6. Update electronic site, building, and service line data (facility management)

7. Compare and contrast industry trends and analytics by service;

8. Assess relevant metrics;

9. Involve users (physicians and C-Suite)

10. Assess priorities by budget;

11. Test alternatives;

12. Demonstrate a sustainable road map.

Balancing the budget within a healthcare delivery system is complex, often the highest priority, even though patient satisfaction is stated as the most important aspect of service delivery. This mindset overlooks the impact of first impressions that are associated with way-finding, adequate parking, private waiting, service responsiveness, and overall convenience. The architectural atmosphere is certainly important and helps in reducing the stress of feeling sick and confidence for a successful recovery.
References


