Pharmacy Review Group

Pharmacy Outsourcing Proposal

Thomas Hospital's Best Option for Quality Improvement and Cost Reduction

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Introduction

Thomas Hospital, in rural Alabama, has been serving the community for over 30 years. As the only healthcare facility for a 70 mile radius, Thomas has been responsible for providing the population of 50,000 with a wide range of healthcare services, both for those requiring hospitalization, and for those requiring ambulatory care. The hospital is licensed for 250 beds; however, routine operations typically fill about 150 beds annually. Over the past 2 years, the cost of providing care has skyrocketed, and the organization suffered a significant fiscal deficit in 2007 of $1.5M, and the facility is well on its way to realizing an even larger deficit of about $2.5M for FY 2008.

The extent of these losses over the past 2 years has created a tenuous situation for the hospital management team. Senior Management has been charged by the Board of Directors with the task of investigating options to stem the losses. Several Performance Management teams have been created, and charged with researching options in each of four Clinical Support Service areas: Imaging services, Clinical Laboratory services, Pharmacy services and Intensive Care Monitoring services. The goal for each of these groups was to consider outsourcing of services, in an effort to reduce financial burden, while maintaining the quality (if not improving it) of services provided.

This report will serve to outline the research undertaken by the Pharmacy Review Group to explore several options, and present our best recommendation. The options explored for outsourcing Pharmacy services included:

- Outsourcing services to University Hospital, 100 miles away. This would continue to strengthen ties many of the community physicians have with the University.
- Outsource services to a commercial service provider, which provides similar services to our nearest neighbor about 70 miles away. The provider considered is a nationally based, for profit organization.

It is our belief that a blend of these two options represents the optimal solution for Thomas Hospital, with respect to Pharmacy services. The balance of this proposal will outline the information and assumptions utilized for our research efforts, the risks and benefits of each option, and explain the unique advantages presented by a blended solution.

Thomas Hospital Environment

General Hospital Overview

Thomas Hospital, as mentioned above, serves a rural community of about 50,000, in Fairhope, Alabama. The services provided by the hospital represent those of a typical acute care facility. The key statistics about our facility are shown in the table below[1]:

Item	Current
Licensed beds	250
Staffed beds	150
Outpatient Visits	49,775
Annual ED visits	12,556
Total Number of Births	633
Total Admissions	8545
Total Operating Budget	$125,000.000
Payor Mix	40% Commercial 30% Medicare 20% Medicaid 10% Self Pay (uninsured)
Highest Diagnostic Groups	Hypertension Heart Disease Diabetes
Average Patient Days	4.2

Pharmacy Overview

In general, the pharmacy provides comprehensive medication services for all inpatients of the hospital. When patients are discharged, home medications are occasionally provided however, it does not serve as a retail pharmacy for the community. The range of operational services provided includes:

- Medication Dispensing
- Staffing
- Inventory Control
- Purchasing
- Patient Charge Capture

- Administration and Quality Control monitoring
- Information Technology Maintenance
- Clinical Pharmacist services (patient education, physician consultation, therapeutic monitoring, order review)

Data for current Fiscal Year operations are presented below[2]:

Item	Current
Number of Units Dispensed Daily (Annual)	2000 (730,000)
Lines entered into PIS* daily (Annual)	1500 (547,500)
Purchasing Costs	$600,000/mo $7,200,000/yr
Costs per adjusted Patient Day Patient days per year	12485
Budgeted	$169.00
Actual	$182.05
Budget	
Flexed	$2,118,.579
Actual	$2,572,,832
Net-Over budget	$154,253,25

**** PIS = Pharmacy Information System***

Key among current concerns is the expenditure for staffing to provide the Pharmacy services outlined above. There has been an alarming trend of increasing salaries for pharmacy professionals over the past several years. Additionally, rural hospitals are have had difficulties attracting not only adequate numbers, but also highly qualified staff due to their location.

With our 150 occupied beds, the complement of staff and salaries maintained is outlined below:

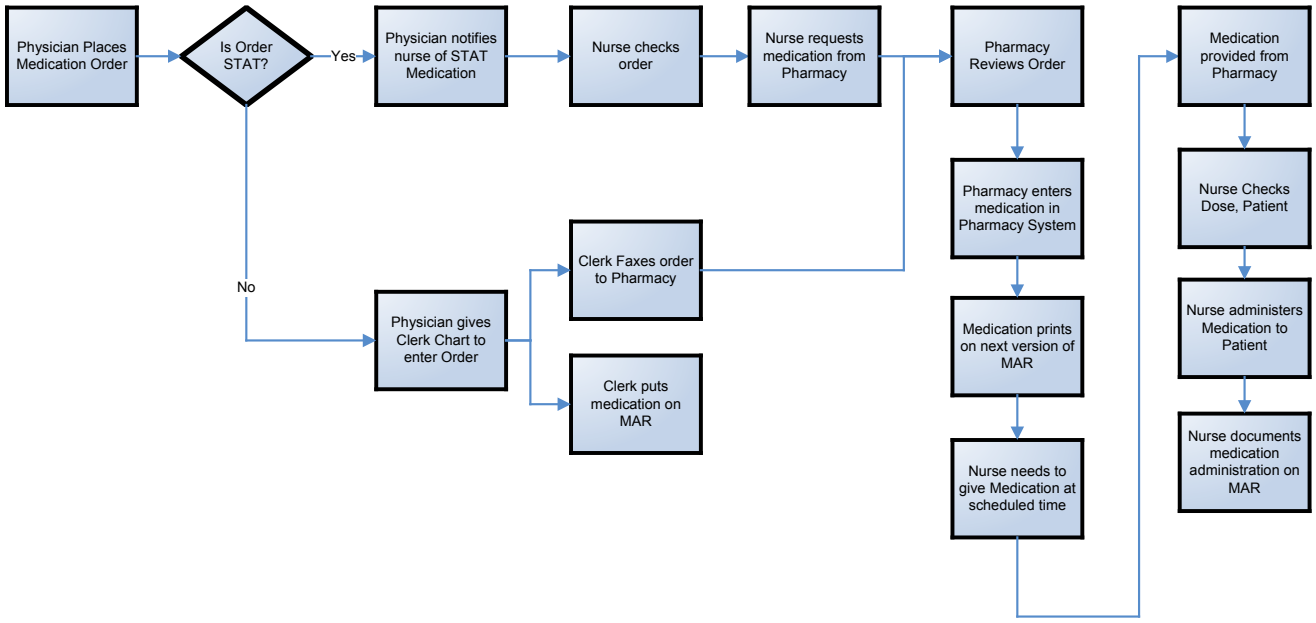
Item	Current
Staffing Mix	
Pharmacists	2 Days 2 Nights 1 Day Weekend 1 Day nights
Technicians	4 Days 3 Nights 3 Days weekend

	2 Nights weekend
Staffing Totals	
Total Pharmacists*	10
Total Technicians	10
Total Managers	2
Staff Salaries (Annual Expenses)	
Pharmacists	$900,000
Technicians	$250.000
Managers	$200,000
Benefits (@24.5 % of Salaries)	$350,000
Total Salary Expense	$1,680,000

*One Pharmacist each shift is 'Clinical Safety Pharmacist'

Operational Workflow

The workflow of the current order management & medication administration process is shown below:



There are a number of points at which errors are frequently made. The most common include physician error (wrong dose, frequency, strength or route ordered), pharmacy review errors (drug-drug interaction, drug-allergy interaction or physician errors not corrected), pharmacy dispensing errors (providing incorrect medication, strength, dose, route), and medication administration error (nurse grabs wrong patient's medication, pulls correct patient's incorrect medication, mixes medication at wrong strength). Pharmacy order entry errors (typically small in number) must also be taken into account.

In our hospital, we have noted our 'correct' medication rate to be approximately 85%, far less ideal than desired. This leaves a 15% error rate, typically resulting from a combination of the above failure points.

Our pharmacists typically spend about 67% of their time on dispensing medications. Clinical activities consumed about 22% of the time, while managerial activities take about 9% of the time. The remainder of time is spent on such activities as billing, secretarial or administrative responsibilities and quality assurance activities.[3]

Quality Considerations

The whole topic of managing the medication management process has received much attention of late, in both the clinical and lay press. The attention brought to bear on the problem was highlighted with the IOM report "To Err is Human" in which it was estimated that somewhere between 44,000 and 98,000 Americans die each year as the result of medical error. The proportion of these attributed to medication errors is approximately 2 of every 100 admissions…which would translate at that time (1997) to about 672,000 per year.[4]

In a more recent study[5], while over 99 percent of medications leaving a hospital pharmacy are free from errors, even a low <1% error rate translates into a huge number of errors, many of which represent potential harm to patients. For our hospital, with approximately 8,545[6] admissions per year, each patient (which includes newborns) receiving an average of 10 medications per admission, we process well over 85,450 pharmacy transactions each year. At 0.0075 errors per medication administration, this rate would mean 640 medication errors coming out of our pharmacy. Using the article's estimation that of these undetected errors, 23.5% are potential adverse drug events (ADE's), we face 150 ADE's per year. This is unacceptable.

There are any number of performance indicators that hospitals and in-house pharmacies utilize to monitor performance. Representative examples of these are listed below:

Order Processing:

- Interval from time of receipt of order to entry into Pharmacy system, stat and non-stat
- Interval from order entry to validation
- Interval from validation to release to automated dispensing unit or delivery to unit for administration
- Number of times medication dispense does not match order (dose, route, additions, strength)
- Medication errors should be less than .1% of total transactions

Inventory[7]:

- Number of times standard formulary medication out of stock
- Percentage of medications out of date in inventory

- Violations of disposition methods from state/federal regulation and/or standards of practice
- Number of inaccuracies between inventory on hand on actual count compared to inventory list
- Types of medication inventory inaccuracies (narcotics, antibiotics, etc)

Admixture:

- Sterility of mixing environment reflected by routine environmental cultures, % positive

Record-Keeping:

- Originals or faxed originals of orders available for 100% charts
- Required information, including patient demographics, medical record number, allergies are clearly marked on the chart/copy of the order
- Drug acquisition and disposition records, including narcotics wastage, are maintained for 3 years
- All medication errors are investigated within 2 business days from date of medication error discovery, with record for quality assurance to include critical information, findings and determinations, and recommended changes to policy, procedure, system or processes if indicated[8].

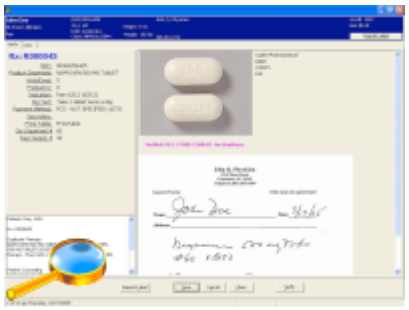
We currently utilize most of these, and have noted that the quality indicators have been declining in the past 2 years, as volume of transactions has increased, patient acuity is higher, and the number of new medications released each year is growing. This creates a tense situation, which would at best require additional staffing and improved processes or implementation of technology solutions to overcome.

Technology Environment

The hospital currently uses the GuardianRx pharmacy management system in a stand-alone configuration, which provides the following functionality:

- Order entry with allergy and drug interaction checking
- AutoRefill scheduling and refill processing
- Automated interface with the hospital's AR patient billing module
- Electronic scanning of hard copy prescriptions issued by physicians to reduce paper maintenance and errors, and simplify recall and review of data.
- HL7 interfaces for future integration with other clinical systems

System functionality includes alerts and safety cap flags, bar coding and scanning, drug images and imprints for automated Rx and Dispense verification. The order verification screen displays at a minimum:



- the scanned Rx,
- dispense information,
- drug image and/or drug imprint, and
- DUR results.

The screen also provides fields for verification of initials/signatures which is tracked and stored in the system. The verification screen can be accessed at any time in the process after scanning of the Rx and is configurable and the individual pharmacy/user is able to filter down to the areas/data they wish to have displayed to view for verification purposes. The system also has features to ensure HIPAA compliance in Transactions, Privacy and Security, assisting users in tracking, and reporting compliance

The Pharmacy uses a variety of internet resources for clinical reference, community, and industry information:

Rx List (www.rxlist.com) provides:
- prescription and over the counter medications
- contra-indicated conditions and drug interactions
- medical conditions and general clinical information
- industry updates

Pharmweb (www.pharmweb.net) provides
- professional newsgroups and discussion forums
- professional associations and event notices
- government and regulatory information

Drug Info Net (www.druginfonet.com) provides
- an extensive library of clinical information
- industry and research information
- official package inserts for health professionals and patients

Outsourcing Considerations

Overview

Health care organizations considering outsourcing pharmaceutical services must have a clear understanding of what they want to accomplish. Consideration should include, at the least, an internal needs assessment, a cost-benefit analysis, and a careful review of possible contractors. The organization should examine the potential long-term consequence of outsourcing as well as the short-term outcomes expected during a contract's performance period.

In order to manage the increasing costs of managing a hospital, many other similar facilities have chosen to outsource various services. The critical question posed to our Pharmacy Outsource Group is whether outsourcing certain operational pharmacy functions represents a viable option. When should outside experts be used to compliment existing management and where is it practical? There are a number of areas to consider in our current environment: technology requirements, staffing requirements and shortages, patient safety and quality, and cost management.

Technology

The demonstrated need for increased automation to streamline pharmacy operations requires new management methods involving specially trained resources. Coupled with this demand are the increased expenses for acquisition and maintenance of complex technology. It has been estimated that companies using an outsourced application service provider (ASP) can reduce their IT expenditures by anywhere from 35% -55% over the life of the application.[9] As indicated in a 2003 article introducing the growing trend of pharmacy outsourcing, there are a number of benefits to outsourcing technology and Pharmacy Information Systems, rather than purchasing the tightly coupled hardware/software packages:[10]

- Low, if any, upfront costs of acquisition
- Reductions in wastage through only paying for what is used
- Enables a 'trial before purchase'
- Flattens unpredictable IT expenses into a consistent monthly charge
- Minimal set up or integration efforts
- Instant upgrades and access to improvements
- Partial or complete elimination of in-house technical personnel
- Elimination of monthly maintenance contract charges
- Decrease in physical space requirements for servers, hardware
- Instant scalability to meet demand
- Guaranteed uptime and performance
- Greater security to protect privacy
- Automated data backup and redundant systems
- Guaranteed HIPAA compliance within applications and processes

- Can provide synergy with current in-house systems to expand capacity during peak hours

Staffing Requirements

Key trends facing current pharmacies:

- From 2005 to 2007, the median salary for a pharmacist with 5 years experience rose by 11.3% from $86,900 to 96,730 or an average of 5.6% increase annually.[11]
- Salary studies continually predict an increasing shortage of pharmacists[12]

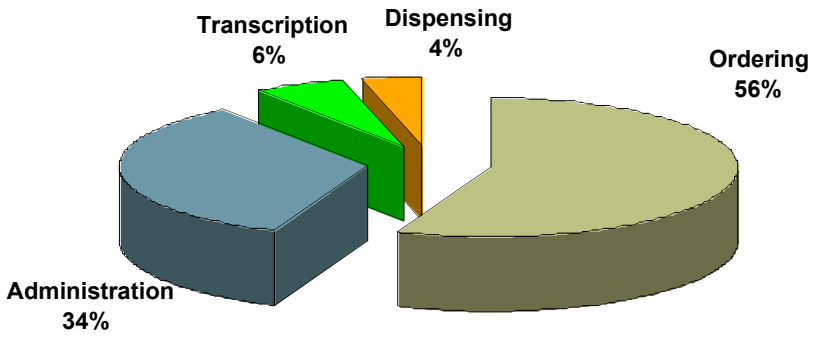
A review of salary forecasts indicated that demand will continue to exceed supply for qualified pharmacists. Based on an ASHP National Survey of Pharmacy Practice in 2005, which included 1,200 hospitals, the hospital with 250 beds is expected to maintain a staffing level of 16 pharmacists, 16 technicians and 2 managers with a 24/7 operating schedule.[13] Because of this industry trend, the ability to attract and retain skilled pharmacists has been very difficult, particularly in non-metropolitan areas. This has beleaguered rural hospitals to adequately staff the pharmacy to provide comprehensive, high-quality pharmacy services.

Outsourcing staffing to a vendor would include providing all levels of pharmacy personnel, allowing the full range of clinical services as well as human resource functions to be taken over by the provided staff. This would include many of the operational items, such as development and maintenance of policies and procedures, record-keeping, unit dose medication distribution, preparation of sterile products, pharmacokinetic monitoring and dose consultation, therapeutic monitoring, patient/staff/family education, and repackaging. The human resource functions would include such items as competency assessments, performance evaluations, productivity reviews, management/operational and clinical training, and recruitment/retention assistance.[14]

Patient Safety & Quality

As mentioned in the overview of our pharmacy quality environment, medication management and patient safety have received much attention in the past few years. The alarming statistics outlined in the IOM report "To Err is Human", as well as the follow up report "Crossing the Quality Chasm" have sensitized all levels of hospital leadership, as well as the public to this crisis. In looking at any pharmacy operation, we have to consider all the places where errors occur in the medication administration process—certainly, considering outsourcing these operations should not be done unless the quality and safety improves dramatically from our current status.

When analyzing the various sources of error, we see a disproportionate amount occur in the ordering process.[15]



In typical pharmacy operations, of the errors in ordering, 69% of errors are intercepted, of those from administration, only approximately 12% are intercepted, which leaves 22 % of medication doses being administered in error. These errors were categorized as wrong time (43%), omissions (30%), wrong dose (17%), and administration of an unauthorized drug (4%). The alarming statistic that drops out is that of the doses administered in error, 7% represent potential adverse drug events—instances of patient harm[16].

Efforts to improve the medication administration process are multi-tiered. Clinical modules may be installed or implemented to provide lab views, pharmacy rules, interaction and allergy checking, and provide comments on labels on medications. A number of applications and technology tools can be introduced, including the use of bar coded medication administration to ensure the 5 Rights (Right Patient, Right Drug, Right Dose, Right Time, Right Route). Other applications include use of an electronic medication administration record (EMAR), Emergency Department medication management, and Operating Room medication management. Finally, a number of process changes can provide substantial improvements in safety, the two most common being the use of electronic documentation and computerized physician order entry for medication ordering.

Implementation of these improvements will result in substantial benefits[17]:

- Legibility
- Access to a complete record
- Simultaneous access by multiple providers
- Access from various locations
- Decreased redundancy – patient, clinicians, family
- Interaction & duplication checking
- Information provision in real time

Cost Management

When organizations face any number of financial obstacles to providing quality services, cost management becomes critical. Organizations facing restricted budgets, increased

operating costs, increasing drug costs, and increased emphasis and requirements to measure performance in terms of staffing and overall operational costs rather than clinical outcomes are the ones most likely to consider outsourcing as a possible resolution to these financial pressures. From a financial perspective, there are a number of ways in which outsourcing services can improve the operating budget required for the pharmacy. These benefits include[18]:

- Control or reduction of costs of providing services
- Reduction or control of labor costs
- Reduction of risk through sharing with services provider
- Reductions in hardware purchasing and maintenance costs
- Avoidance of physical space remodelling for specialty services
- Increased operating margin through improved purchasing, reduced wastage, improved billing/charge capture.

The literature highlights the need for an operational review of the pharmacy department prior to any outsourcing agreements being undertaken. This impact analysis report clearly identifies key tasks and responsibilities pre- and post-outsourcing. It should also include a list of existing costs including overhead. The impact report should identify what costs could be assumed by the outsourcing provider. Some other key areas the impact report should address are the level of effort is required to monitor the outcome of the outsource provider and perhaps most importantly, what are the departmental financial, operational and compliance risks and how can those risks be assumed by outsourcing.[19]

Outsourcing to University Hospital

After conducting our own operational review, we considered 2 possible options for outsourcing. Both have their unique advantages and disadvantages. Our considerations included

- Outsourcing all components of pharmacy operations (as listed above in Introduction section)

- Outsourcing some portion of services, such as admixture, management, and night/evening remote pharmacist coverage.

Because of our current Pharmacy Operations and technology environment, there were several ***advantages*** offered by integration with the University Hospital:

Electronic Medication Administration Record (EMAR)
Currently we do not utilize an electronic MAR; relevant information is recorded manually on a physical patient chart, updated daily through the pharmacy management system.

Integration with University Hospital would support the introduction of the Pyxis system for automated drug dispensing and inventory control. The use of Pyxis would work well with an EMAR to provide additional benefits in medication safety and billing accuracy.

Using the current an interface between the GuardianRX Pharmacy Management System (PMS) and the hospital's billing and accounts receivable system, Pyxis can upload data based on documentation by the nurse in the EMAR. The system will bill medication upon being dispensed with subsequent manual reconciliation to ensure that missed or partial doses are properly credited to the patient's account.

The EMAR can be implemented to generate message transactions indicating the medication order, date, time, and person documenting the medication administration in a suitable format for transmission to the pharmacy information system. Additional development may be needed to enable the PMS to accept these interface transaction messages, and allow review by an onsite or offsite pharmacy manager.

Depending on the selected approach, new billing system logic and other features such as exception reports, billing-detail records, and billing-error reports may be needed. Procedural changes to the workflow may be required, affecting staff in the finance department and pharmacy.

HL7 Messaging
Although the Guardian Rx PMS is capable of sending/receiving HL7 messages, it was implemented as a stand-alone system thus there was no requirement to support clinical data exchange. Introducing the Pyxis® MedStation™ 3500 system and Pyxis® SMART Remote Manager, plus integration with the University and vendor systems will necessitate rolling out HL7 protocol support. For more information on Pyxis, please see **Appendix 1.**

The benefits are clear with these technology introductions, enabling online information exchange via HL7 with governmental, insurance, and research entities. It will also improve our hospital's eligibility to participate in pilot programs such as offered by CMS to improve efficiency and measure clinical quality performance.

Clinical Quality and Compliance
Implementation of Pyxis system components managed by the University Hospital also supports compliance with Joint Commission and regulatory requirements:

- Helps to secure temperature-sensitive medication, track controlled substances and manage storage device temperature
- Streamlines temperature-sensitive medication distribution and storage device temperature management
- Warns users if medication has been exposed to an inappropriate temperature and facilitates a rapid response to a refrigerator failure preventing loss or harm
- Reduces risk of harm early in the medication use process
- Protects against diversion and promote pharmacist order review

Operational Efficiencies
Improved automation capabilities will offer:
- simplified workflow, enhancing nurse and pharmacist productivity
- reducing turnaround time in starting patient therapies
- capture of productivity data to support process improvement, control costs and increase revenue

Considering the range of services required for pharmacy operations, full dependence on the University Hospital poses several ***disadvantages***:
- *On-site support staffing*: the University Hospital is a teaching institution and not in the business of providing or managing pharmacy technician and related clinical support services on a 24/7 basis
- *On-site pharmacist staffing:* While the University is well-positioned to supplement the regulatory mandated on-site pharmacist with off-site quality control and contract administration professionals, its physical location 100 miles away from rural hospital poses some logistic complexities.
- *Contingency admixture:* While cost savings may be feasible through off-site prescription preparation, admixture, compounding etc., full reliance on the University Hospital poses risks in contingency scenarios when rapid turnaround of these services is critical to patient care

While these present some compelling arguments, we felt that we needed to dig further. We realized that partnering with the University hospital would require some effort and expense to 'build' the integration and technology platform for communication with the University, as well as a need to install Pyxis stations in the Pharmacy and on the units. Looking at the potential costs of undertaking such a project revealed a significant outlay as outlined in **Appendix 2**. The net expenditure would amount to approximately $514,008. This project would not be without risk since this type of service is not a core competency of the University Hospital pharmacy.

Outsourcing to a National Service Provider

We investigated the possibility of outsourcing services (again, all or a portion) to a for-profit national service provider. There are a number of advantages and disadvantages in considering outsourcing in general, as seen in the table below:

PROS	CONS[20]
Operational and Organizational	
Strengthens the consolidation of pharmaceutical services	Hospital may not receive any additional benefits based on the fact the current service is well maintained
Can resolve operation inefficiencies by Decreasing med errors Increasing patient education Increasing information technology	Vendor does not deliver Loss of control over pharmaceutical decisions and operations
Relocation or consolidation of resources	Costs of outsourcing are reversed
Staffing	
Fill hard to fill positions	Staff decreased to unacceptable levels sacrificing quality
Reach optimal staffing levels	Could lead to estranged relationships with health care staff
Financial	
Improved control and or decreased cost of service	Outsourcing increases versus decreases costs
Costs of management of employees and benefits are shifted to contractor	Cost savings do not occur
Operations costs of pharmaceutical services are now shared with vendor including equipment	The organization may not be able to recapitalize pharmaceutical services if outsourcing is unsuccessful
Increase in the organizations purchasing power Decreased lost charges and improved billing accuracy Decrease in pillage and drug diversion Improvement in drug formularies Transfer of drug inventory, equipment and supply to contractor Improve Quality and Cost	Lower inventory on hand with items not available when needed
Quality	
Expand clinical services and pharmaceutical care services	Conflicting values and priorities between outsourced contractor and organization which could adversely impact quality.
Vendor may be better able to provide support for medical and nursing staffs	Clinical quality could be reduced as a result of loss of continuity of pharmacy staff.
Competitiveness	
Enhance image and better positioning the organization for competitive advantage	If outsourcing is viewed as a negative this will be a problem.
Professional Responsibility	
Outsourcing provider assists with managing its professional responsibility and provide helpful insight and recommendations	Could confuse or dilute onsite pharmacist ultimate professional authority.

More intensive analysis into cost considerations, especially when considering outsourcing the majority of management functions, provides some harsh realities. We reviewed national data statistics and can clearly see that that demand for pharmacy personnel will exceed the supply over the next several years. It is reported that by 2014 the number of pharmacists is expected to increase to 287,000 or by 24.6 percent. This projection is higher than previous projections made for 2000–2010 and demonstrates an increasing trend in job growth for pharmacists. The ability to attract and retain skilled pharmacists is even harder in rural areas like ours.[21]

Currently we are staffing the pharmacy 24/7 and based on this alone we would be prudent to consider outsourcing our night pharmacy coverage. If we implement this and utilize the preliminary cost data provided by the vendor, we could expect to decrease our expenditures in this area by utilizing remote telephonic order entry and review at a cost savings without sacrificing quality of services.

We have reviewed our staffing effectiveness as well. As we can see from the pharmacy profile data provided in the introduction, we are currently over budget in the area of budgeted costs/patient day. Using a technician to do order entry will allow the pharmacists more time for medication review and clinical analysis, crucial to avoiding medication safety errors. This operational change has improved order entry errors, staff moral and nursing satisfaction.[22]

In review of current staffing effectiveness, we have looked closely at wage data within our facility and compared to other hospitals'. Per national 2005 data, we can see that the median annual earnings for pharmacists were $89,820-$113,310. While the median annual earnings for pharmacy technicians in 2005 were $24,390-$35,15023. If we chose to outsource, we must keep at least one to two pharmacists in-house during the day shift to manage mandated on-site tasks related to inventory control, controlled substances and clinical pharmacy review.

In considering staffing provided by the vendor, we would be able to minimize the number of pharmacy personnel employed by the hospital. This would afford the hospital a safety net from the vendor who will supply pharmacists adequately and in turn relieve the hospital of the burden of costly payroll overhead in the next few years. The hospital will save approximately $859,000 a year in the reduction of pharmacy personnel as shown in this table:

Position	Salary Savings	Comments
Pharmacist	$540,000	Eliminate 6 positions at $90,000 each
Technician	$150,000	Eliminate 6 positions at $25,000 each
Benefits	$169,100	
Total	$859,100	

In-house pharmacy personnel will cover morning and afternoon shifts but will be complemented by outsourced pharmacy personnel. Night shifts will be covered by outsourced pharmacy personnel except the pharmacist in charge. An example of pharmacy staffing is specified in this table:

Position	Morning Shift	Afternoon Shift	Night Shift	Comments
Pharmacy Manager	1	1	1	In-house pharmacist rotated to act as night shift in charge
Pharmacist	1	1	1	Outsourced pharmacist providing remote order entry on night shift
Technician	1	1	1	Outsourced technician will assist remote pharmacist in medication order entry

We currently rely solely on the pharmacy technician to dispense and deliver medications throughout the hospital. This is time consuming and can lead to loss of medication as well as medication errors. We recommend the implementation of automated dispensing cabinets. These have proven very effective in smaller rural hospitals and would allow the pharmacy the ability to stock most medicines into the machine and give nurses access only when the medication is ordered and entered into the system. The technician would then be utilized for only speciality deliveries to the units. This recommendation would require upfront IT costs to get the devices up and running, however there are documented substantial cost savings as well as rapid ROI By outsourcing with the appropriate vendor, the cost of introducing automated dispensing would be factored into the contract, paid on a monthly basis, with the equipment essentially in a lease agreement.

In review of our current purchasing contracts with medication distributors, we recognize there is room for improvement and outsourcing this operation would provide benefit from access and participation in a larger purchasing pool with demonstrated lower drug costs.[24]

As an operational improvement, we have worked diligently to standardize our formulary to move toward better inventory control and costs. We continue our work this area in an attempt to decrease the small volume multi-choice fragmentation that can be reflected in the formulary without this continual process improvement project. Outsourcing would

facilitate acquiring a dedicated pharmacy purchaser to keep tight control on best purchasing practices and inventory analysis to evaluate shelf life of products and wasted our outdated meds.[25]

Additionally, outsource vendors can provide expanded services in ordering and purchasing pharmacy supplies based on the contract between the hospital and vendor. These rules such as ABC item classification reorder points and lead times would be defined in the vendor's inventory system allowing for the hospital to monitor purchases and generate control reports. The hospital will also benefit from the vendor's purchasing pool buying power and discounted pricing. Based on a determined level of inventory for the rural hospital and an expected reduction of unnecessary inventory stocking and purchases, the rural hospital can save in inventory expenditures. For example, with its purchases of $7.2 million and an expected 10% pricing discount, the hospital can generate savings estimated at $720,000.00 annually.

Committee Recommendations

It is our belief that the optimal solution represents a blend between the two outsourcing solutions. With the annual operating losses of $1.5M last year, and a potential $2.5M loss this fiscal year, we would like to dramatically contribute to cost reductions in our department. We have assumed that the losses are equally attributed to all four areas under consideration, thus, we would consider our cost reduction target to be approximately $600,000. Our goal has been to provide a solution that offers at least that level of cost reduction.

There are certain competencies that University Hospital has to offer which are attractive, but the technology build requirements to fully outsource to them become cost prohibitive. There are also core services that the service provider would provide which facilitate improved quality of our services, and facilitate overall cost reductions in operations, purchasing/inventory, and staffing.

With respect to University Hospital, it would be advantageous to outsource our compounding/admixture services, the clinical pharmacy oversight and the provision of a Clinical Safety Pharmacist to them. The admixture services outsource would offer a number of benefits as outlined in **Appendix 4**[26]:

With respect to the for profit service provider, we believe that it would be advantageous to outsource the general staffing and technology components (including installation of Pyxis dispensing machines) to them, as well as night and weekend Pharmacist review and order entry, for all the reasons outlined above. A cost analysis of this route provides the following estimations:

COST	Per Year		
Professional Fess	$ 102,800.00		$514,000.(Appendix 1) amortized for 5 years
Amortized Hardware/Equipment Lease	$ 47,800.00		Useful life/Lease is based on 5 years.(Appendix 2)
VPN/Communication Line	$ 3,600.00		
Outsourcing Contract Fees	$ 715,390.00		Based on patient discharges at 71,539 (Patient visits, admissions, births) at $10 fee
	$ 854,500.00		Based on unit dispensing service at 85,450 at $10 fee
Total Costs 1	$ 869,590.00		Using patient discharges billing method
Total Costs 2	$1,008,700.00		Using unit dispensing services billing method
SAVINGS			
In-House Pharmacy Personnel			
Pharmacist	$ 672,300.00		Eliminate 6 from current 10 pharmacist at $90K/yr + benefits
Technician	$ 186,750.00		Eliminate 6 from current 10 technician at $25K.yr + benefits
Sub-Total	$ 859,050.00		
Reduction in Inventory Purchases	$ 720,000.00		At $7.2 million purchases and 10% reduction
TOTAL SAVINGS	**$1,579,050.00**		
Estimated COST vs. SAVINGS	**Per Year**		
NET SAVINGS - 1	$ 709,460.00		Using patient discharges billing method
NET SAVINGS - 2	$ 570,300.00		Using unit dispensing services billing method

Conclusion

In an environment of increasing costs, increasing quality regulatory expectations, staffing shortages and aging population, Thomas Hospital has had difficulty continuing to service the community in a cost-effective, safe manner. It has become increasingly difficult to 'keep up with the Joneses' as it were—to meet the national standards of care now considered the norm. As such, the hospital has suffered financial losses that imperil the community's ability to receive healthcare. Without dramatic, concerted efforts, we would have to direct our patients elsewhere for care, creating significant hardships for them. Cost cutting measures, increased revenue opportunities, and searching alternate means of providing cutting edge services are at the forefront of consideration.

Our next step would be to issue a Request for Proposal (RFP). In that RFP, we would outline many of the requirements for vendors interested in working with us on this effort. Some if the items that we would include are:

- Cost Request/Containment Measures:
  - Request for Quotation for Outsourcing Service
  - Negotiate for Price on Outsource Service – Target $10 fee per transaction

- Negotiate to Lease Equipment for 5 years instead of Purchasing with Vendor
- Negotiate for free or credit training on Software and Automated devices - PYXIS
- Negotiate for 100% take on savings(instead of vendor sharing) due to use of
- Inventory management system software.

- Human Resources Measures
  - How to retrench 6 pharmacists, 6 technicians – lay off on staggered basis, negotiate
  - Affected personnel, request assistance from vendor to absorb affected personnel if possible.
  - Conduct training by vendor on new process(software and automated equipment/devices)

- Output/Productivity measures
  - Ensure that new shifts(esp. night shift) be well-communicated/coordinated with Vendor and Pharmacy staff.

We are confident from extensive consideration of our current situation, in-depth review of the literature and comparison with like facilities our outlined blended solution would result not only in significant cost savings, but also improved staff morale, patient safety and quality of services.

Appendix 1: Pyxis Information

Pyxis® MedStation™ 3500 system

Advanced automated medication management system
The Pyxis® MedStation™ 3500 system builds on proven Pyxis® automated medication management technology with new capabilities that help make the medication management process simpler, safer and more secure. It offers innovative communication and workflow optimization tools to help enhance nursing and pharmacy's ability to work more efficiently and effectively as individuals and as a collaborative team in their efforts to deliver safe, high-quality patient care. Hospitals now have more flexibility to initiate data archiving and generate reports that can be used to help identify and prevent potential diversion, optimize medication utilization and manage costs. Add to that, the ability to strengthen network security.

Secure stations and auxiliaries are available in a variety of sizes and configurations with drawer types that offer single line-item access and single-dose dispensing.

Key advantages

- *Enhance nurse and pharmacist productivity by simplifying workflow*
- *Start patient therapies faster by reducing turnaround time*
- *Reduce risk of harm early in the medication use process*
- *Protect against diversion and promote pharmacist order review helping to support compliance with Joint Commission and regulatory requirements*

- *Capture data and turn it into information to support process improvement, control costs and increase revenue*

Automated temperature-sensitive medication dispensing and monitoring system

The Pyxis® SMART Remote Manager *is the first system to automate temperature-sensitive medication distribution and storage device temperature monitoring. It integrates with the Pyxis® MedStation™ system to provide controlled point of use access to temperature sensitive medication and monitor internal temperatures of storage devices. In addition, the system electronically archives transaction and temperature data and generates reports necessary for regulatory compliance, inventory management and billing.*

Pyxis® SMART Remote Manager includes a software module, electronic locking latch and a temperature sensor with digital display. It can be installed on many commercially available refrigerators.

Interfaces between Hospital and University
Interfaces are the electronic channels that allow transfer of information between a hospital's information system (HIS) and Pyxis® products. A core competency of Cardinal Health, we have developed interfaces with nearly every major system vendor, as well as proprietary system interfaces. Our interfaces allow for the transfer of patient ADT information as well as medication and supply billing and usage data. We also provide interfaces that allow Electronic Data Interchange (EDI) with many of your hospital's wholesalers. This enables you to place quicker orders, resulting in timely restocking of medications and supplies. We work with each hospital's Information Services (IS) department to ensure we optimize your information transfer needs.

Appendix 2: Technology Implementation Project Costs

Professional Services Projected Cost Estimate			
Roles and Hourly Rate (approximate)			
Hospital Project Director	$240		
Hospital Project Manager	$140		
Pyxis Application Specialist	$160		
Pyxis Integration Engineer	$200		
Pyxis Field Service Technician	$100		
Pyxis Clinical and Materials Advisor	$100		
University Clinical Advisor	$240		
University Technical Advisor	$100		
Project Phases and Staffing			
Phase	**Role**	**Hours**	**Total**
Initiation	Hospital Project Director	40	$9,600
Initiation	Hospital Project Manager	160	$22,400
Initiation	University Clinical Advisor	20	$4,800
Initiation	University Technical Advisor	20	$2,000
Requirements	Hospital Project Director	40	$9,600
Requirements	Hospital Project Manager	160	$22,400
Requirements	Pyxis Clinical and Materials Advisor	40	$4,000
Requirements	University Clinical Advisor	40	$9,600
Requirements	University Technical Advisor	40	$4,000
Design	Hospital Project Director	40	$9,600
Design	Hospital Project Manager	160	$22,400
Design	Pyxis Application Specialist	80	$12,800
Design	Pyxis Integration Engineer	80	$16,000
Design	Pyxis Clinical and Materials Advisor	80	$8,000
Design	University Clinical Advisor	160	$38,400
Design	University Technical Advisor	160	$16,000
Build and Test	Hospital Project Director	40	$9,600
Build and Test	Hospital Project Manager	240	$33,600
Build and Test	Pyxis Application Specialist	160	$25,600
Build and Test	Pyxis Integration Engineer	160	$32,000
Build and Test	Pyxis Clinical and Materials Advisor	80	$8,000
Build and Test	Pyxis Field Service Technician	20	$2,000
Build and Test	University Clinical Advisor	160	$38,400
Build and Test	University Technical Advisor	160	$16,000
Training and Operational Readiness	Pyxis Clinical and Materials Advisor	40	$4,000

Training and Operational Readiness	Pyxis Application Specialist	40	$6,400
Training and Operational Readiness	University Clinical Advisor	40	$9,600
Training and Operational Readiness	University Technical Advisor	40	$4,000
Annualized Ongoing Support (2 yrs)	Pyxis Clinical and Materials Advisor	80	$8,000
Annualized Ongoing Support (2 yrs)	Pyxis Field Service Technician	160	$16,000
		Subtotal	**$424,800**
		10% Travel & Expenses	**$42,480**
		10% Contingency	**$46,728**
		Grand Total	**$514,008**

Appendix 3: Hardware Costs

Hardware Costs			
1. Servers(1 Back-Up)	$ 34,000.00		$17,000.00 each
2. Cables	$ 10,000.00		
3. Cisco Routers, Switch Cards	$ 8,000.00		
Amortized for 5 years	$ 10,400.00		
Equipment Lease			
2.1 Pyxis Medstations	$ 30,000.00		10 units at $3,000 each
2.2. Scanners/ Storage Bins, Accessories (e.g. video, camera,)	$ 140,000.00		20 units at $7,000 each
Lease per year	$ 37,400.00		10% interest on lease

Appendix 4: Admixture Outsource Advantages

- Decreased pharmacist and technician time, operating costs, labor, equipment, devices, handling, waste, etc.
- Improved tracking of ingredients for creating specific compound types, including chemicals which are not necessarily products that can be tracked by an National Drug Code (NDC) number, but will be ingredients of a compound.
- Ability to generate a formula worksheet which can be set to compute ingredient quantities a specific compound quantity
- Creation of new or existing package size with each batch of a compound, provides updated inventory and a new NDC number for the package size
- Improved lot tracking for the ingredients of a compound or on individual batches and managed in inventory and for “authorization” by the pharmacist.
- Improved inventory control for components, as ingredients of the compound are decremented in inventory as the batch is created
- Improved sterile processes, as formulas can be flagged to be “sterilized” by type if applicable.
- Ability to conduct Drug Utilization Review (DUR) review if the ingredient is an active First Data Bank product.
- Improved creation and assignment of label warnings and user added monographs to compound products.
- Improved turnover: when dispensing a compound, the lots are managed through inventory and allocated out on the basis of oldest lot first.

Endnotes:

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