Transforming Specialty Care
Hub and Community Shared-Care Satellites

Farah Nabi, BA, CPA, Stephen Gallay, BSc, MD, FRCSC, Joel Lobo, MD, FRCSC
Jesse Shantz, BSc, MD, FRCSC, MBA

Division of Orthopaedic Surgery, Rouge Valley Health System RVHS, Ajax, Ontario, Canada
Email: fnabi@rougevalley.ca; stephengallay@gmail.com; joellobomd@rogers.com;
jesse@mdcommons.com;

Abstract

The Shoulder Centre (TSC) at Rouge Valley Health System (RVHS) is transforming shoulder care through the implementation of an innovative and comprehensive model of care that builds on novel partnerships between community providers and the Centre's clinical team and leverages technology solutions to deliver evidence based treatments.

The Centre serves as the central operating facility (hub) which hosts a multidisciplinary provider team, including orthopedic surgeons, non-surgeon specialists, primary care providers, physician assistants, and physiotherapists. This team is part of a shared-care network with community providers that is available to manage all patients with shoulder-related conditions using the appropriate and required level of clinical expertise as required by each patient. The Shoulder Centre's model of care also encompasses central intake, triage, assessment, treatment (surgical and non-operative) and education and training of local champions with expertise in shoulder care and community primary care providers.

The Shoulder Centre's shared-care network provides integrated accountable shoulder care to a population of 1 Million people in the Central East Local Health Integration Network (CELHIN), 18,000 of whom develop shoulder pain each year.

Hypothesis

Through the establishment of The Shoulder Centre, RVHS has successfully increased system access, system learning and patient satisfaction while demonstrating reduction in system costs within the CELHIN catchment area. Hypothesis: In order to strengthen the model of care, to expand the demonstrated benefits to a larger or net new catchment area, and allow for the management of shoulder complaints at the community level, The Shoulder Centre requires the establishment of community satellites that mirror the model of care, resource structure and quality management as the original site at Ajax, which will continue to serve as the hub for The Shoulder Centre.

The establishment of satellites will also overcome the predominant obstacles in most healthcare sectors, which revolve around transparent sharing of service structures and policies that have proven to be successful in other service implementations. The hub and satellite structure will enforce a shared-care environment supported by evidence informed policies.

Methodology

TSC's hub and satellite model is organized to allow a shared-care approach where each designated satellite site becomes a recognized accountable entity, which functions with the same operational principles as the hub. Each satellite site will be required to host a mirror image of the hub, for example, the following structures must be present in each satellite:

- Primary Care Providers.
- Community champion with expertise in managing shoulder conditions
- Central intake/assessment and treatment process
- Use of interactive and intelligent e-referral process
- Stream-lined access to diagnostic testing

Implementation of the same service structures as those encompassed by the hub will ensure that the quality of care received at each satellite site is consistent. The hub will be responsible for providing an over-arching management and support structure, for example by implementing processes and hosting on-going education and training for satellite service providers and their champion. The hub will also maintain a higher level of clinical expertise, allowing satellites the option to refer more acute and complicated patients to the hub.

Results

Establishment of the satellite sites will provide service access to patients within their local communities and will build on the expertise of local service provider champions. Appendix A illustrates the geographic distribution of shoulder patients within the CELHIN and the proportion of patients being serviced at RVHS. Establishment of the suggested satellite sites would allow patients to receive appropriate care within their local communities and provider champions to be developed with enhanced clinical skills. Appendix B provides an example of an interactive dashboard that is currently utilized at the Centre's hub but can be further extended to the satellites for performance and activity reporting.

Conclusions

By reengineering the pathways to obtaining shoulder care, The Shoulder Centre aims to transform the system to facilitate improved operational efficiency, workflow management, quality-of-care, team collaboration and system sustainability. The hub and satellite model demonstrates the benefits of an effective team based environment with physician leads contributing to system transformation and acting as policy advisors by advocating the realignment of resources to ensure the health system remains sustainable.

Introduction

This paper describes an innovative model of transforming specialty care for the delivery of more appropriate and evidence-based care for patients presenting with an initial diagnosis of shoulder pain.

Through the creation of an integrated, multidisciplinary regional shoulder program at the Rouge Valley Ajax-Pickering campus in collaboration with Durham region family physician practice

groups, patients presenting with shoulder pain in Durham will have better access to the most appropriate provider and a more timely accurate diagnosis and treatment.

The program is built on a set of core elements including: the implementation of standardized primary care assessments; reduction in duplicative diagnostic testing, MRIs and specialist visits; utilization of order sets; and integrated care pathways spanning multiple providers. It is also based on the use of consistent, evidence-based approaches to treatment and rehabilitation aligned with the forthcoming Quality-Based Procedure best practice pathway for management of shoulder disorders. This integrated program of care is expected to achieve measurable health system impacts including reduced variability in care, reduced overall health care costs per capita and improved patient outcomes.

As the sponsoring organization for this proposal, Rouge Valley Health System (RVHS) is a recognized leader in surgical and non-surgical treatment of shoulder pain in the Central East Local Health Integration Network (CELHIN). The project team and organization have proven experience in successfully driving improved service quality and cost efficiencies through facilitating service integration with other providers and organizations and applying Lean management and other performance improvement methodologies. This combination of skills, experience and recognized ability to lead system transformation initiatives ensures that the team is well-positioned to successfully implement this proposal and deliver the expected outcomes.

Looking to the future, the evidence-based, integrated model of shoulder care described in this paper is highly scalable for province-wide roll-out, potentially as part of the implementation of the forthcoming Quality-Based Procedure for Shoulder Disorders and as well, other areas of musculoskeletal health. While a recognized leader in high quality shoulder care, RVHS is fundamentally a community hospital, without the unique infrastructure or resources possessed by large academic centres. Hence, the model of care described in this proposal is well-suited for broader implementation in many other community health systems across Ontario.

Given the size of Ontario's shoulder disorder QBP population—with over 8,500 elective shoulder surgeries each year and a further estimate of more than 175,000 cases undergoing non-surgical management—provincial roll-out of this model would achieve millions in savings from reduced avoidable service utilization and provide benefits to patients through enabling timelier access to higher quality, more appropriate shoulder care.

1. Overview of population and care pathway

This paper provides the structure to develop, implement and evaluate an integrated model of care that will champion the delivery of quality, evidence-based and coordinated care to CELHIN patients with shoulder pain. The physical hub for this model of care will be located at the Ajax site of the Rouge Valley Health System.

"Shoulder pain is second only to low back pain in disability and costs and impacts 20% of the population. Rotator cuff tears represent the most common shoulder diagnosis requiring a surgical opinion and affect 50-80 percent of those over the age of 60" (Kissenberth &Thigpen, 2014). However, Primary care Physicians (PCP) typically receive limited orthopedic training during medical school (often only two weeks), yet up to 30% of PCP visits are for patients with musculoskeletal complaints. In patients over the age of 75 years, musculoskeletal complaints

increase to more than 50%. Lastly, research has shown that up to 43% of musculoskeletal referrals to orthopedic specialists are of low value.

Shoulder pain may persist from months to years and can generally be categorized into four primary groups: rotator cuff disorders, instability, frozen shoulder and arthritis. Once correctly diagnosed, approximately 95 percent of presenting patients can be effectively managed with rest, exercise/physical therapy, medication and/or corticosteroid injections. The remaining symptomatic patients generally require a surgical procedure under regional or general anesthesia to resolve their painful disorder.

Unfortunately, shoulder pain is a topic which is often poorly understood by many practitioners. Because of this, patients with shoulder pain are often subjected to delays in diagnosis and treatment leading to avoidable medical visits (to walk-in clinics, ER and other medical specialists), unnecessary or repeated radiological studies (MRI, Bone Scan, Ultrasound, CT scans and plain x-rays), excessive or ineffective rehabilitation and loss of quality of life.

Thus an accurate and early diagnosis of shoulder pain is vital to a sustainable, quality and cost effective model of care.

By developing integrated care for shoulder services and a well-aligned clinical group, insight will be provided for:

- Analysis of the proportions of total cost within the different phases of the non-surgical and surgical care episode (pre-diagnosis, treatment and post discharge services including home care)
- Evaluation of unwarranted expenses and their impact on total episode of care payment
- Efficiency opportunities by implementing evidence based standardized processes

The shoulder care model will demonstrate that integrated care strategies can serve as a mechanism to improve quality and reduce system costs of shoulder pain by incentivizing and aligning providers across the continuum of care to provide a timely and concise diagnosis with reduced downstream costs.
This project proposes initiating a shoulder care pathway at the patient's initial presentation to the PCP using evidence based decision-making tools for diagnosis and treatment. Improved accuracy and timeliness in obtaining a correct diagnosis and treatment will result in improvements to:

- **System Access:** Faster and more effective patient access to specialized services when needed
- **Patient Satisfaction:** Improved patient satisfaction by pairing the right patient with the right provider at the right time
- **System Costs:** Decreased system costs by appropriately allocating manpower and expensive imaging resources
- **System Learning:** Demonstrating and documenting previously hypothesized inefficiencies and opportunities

Population to be served

In the 2013 CELHIN Integrated Orthopedic Capacity Plan (IOCP) discussions, RVHS was acknowledged as the CELHIN's leading shoulder program. The RVHS team has built a reputation for innovation and high quality care in the management of a range of shoulder

conditions. They are provincially recognized as leaders in arthroscopic and open reconstruction of the shoulder. They are also credited in 2005 with the development of Ontario's first regional ambulatory Total Shoulder Arthroplasty (TSA) service.

In 2011-12, RVHS performed approximately 41% of all the inpatient elective, inpatient non-elective and same day shoulder surgeries completed in the CELHIN. RVHS orthopedic surgeon specialists also performed a significant proportion of the non-surgical specialist interventions related to shoulder conditions.

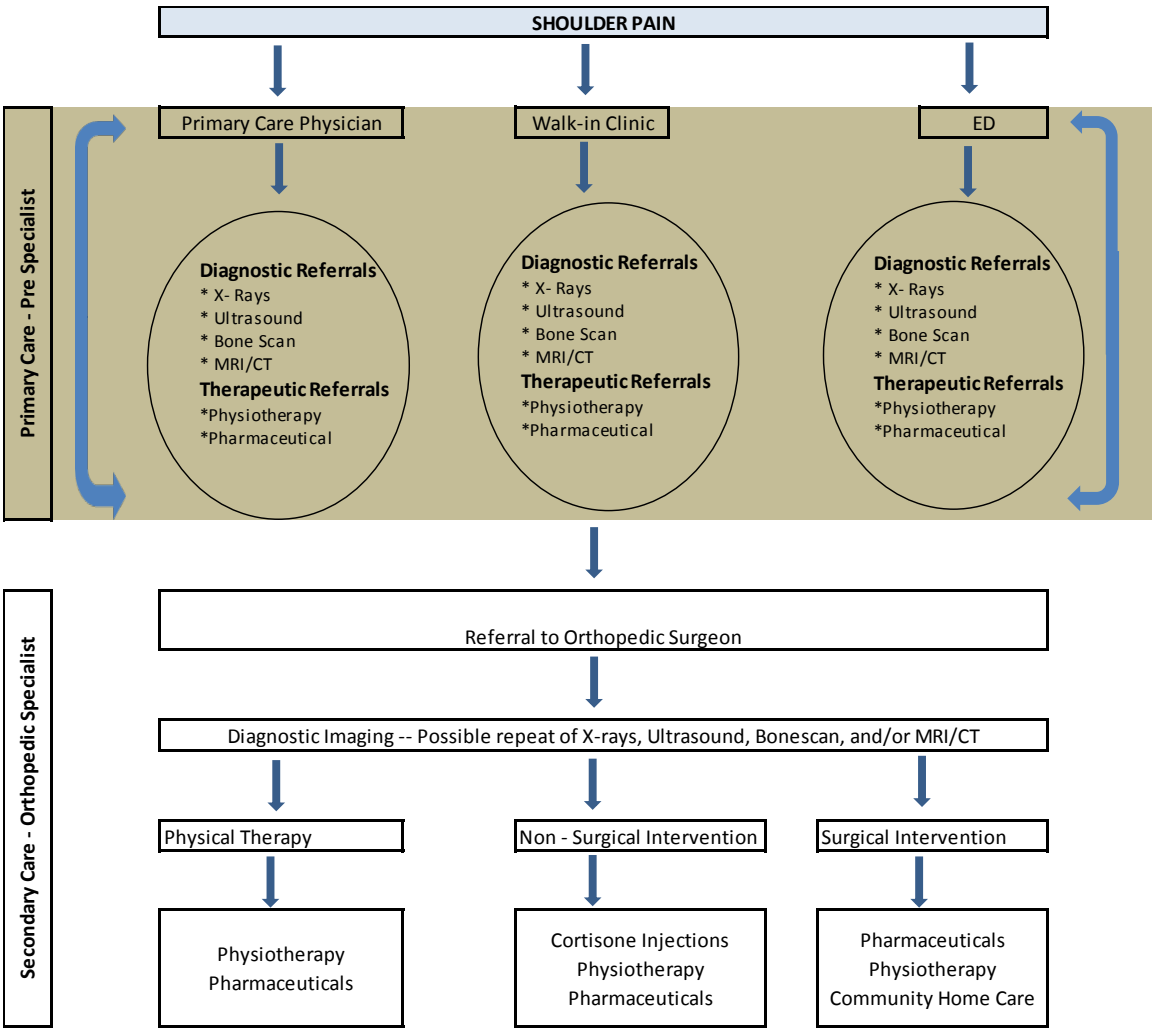
The RVHS orthopedic division, led at the Ajax campus by Dr. Stephen Gallay, continues to demonstrate early adoption of system improvement initiatives. In 2014/15, Dr. Gallay was one of the Subject Matter Experts for shoulder surgery on the Quality Based Procedures (QBP) panel for degenerative disorders of the shoulder. Thus, most of the suggested improvements from the recently completed Shoulder QBP in addition to many of those from previous orthopedic QBPs have been incorporated into the proposed integrated care model for shoulder pain.

The shoulder model of care is designed to establish a regional shoulder program encompassing a multi-disciplinary team, which will utilize evidence-based clinical pathways and enhanced coordination of care plans to increase annual service capacity and decrease total system spending on shoulder pain. RVHS has already gained commitments from two large community GP practice groups (each 30-35 GPs and managing 35-40,000 patients) to establish care pathways for patients presenting with shoulder pain. The two groups will support referrals to the regional shoulder program. The incidence of shoulder pain within a given population is approximately 3% (range 2-4%) thus the expected number of patient shoulder complaints per PCP practice group will be 1,000 patients annually. In addition to these commitments, RVHS is currently negotiating with 5 other GP practice groups to formalize participation in the integrated care model. Participation of the 7 groups will allow for a sample size large enough to offset any PCP specific referral patterns.

2. Current care pathway

Figure 1 provides the existing care pathway to manage patients presenting with shoulder pain currently used by most organizations and community care providers.

Figure 1: Current State Care Pathway for Diagnosis and Treatment of Shoulder Pain



Note: Shaded areas represent treatment/diagnostic phase resulting in multiple visits to care providers.

In the current model of care, patients experiencing any form of shoulder pain initiate their care episode by consulting a PCP at a family physician office, walk-in clinic, or, for rare/ more painful circumstances or inability to access a PCP, at the local emergency department.

<u>Primary Care – Pre Specialist:</u>

The initial assessment by the PCP triggers a sequence of diagnostic imaging referrals to determine the underlying cause of the symptoms being experienced. As symptoms persist, in progressing assessments, patients are referred for:

(i) X-rays
(ii) Ultrasound

(iii) MRI
(iv) CT scan or Bone scan
(v) Other tests

In addition, patients may be prescribed various pharmaceutical and physical therapy interventions to manage the persisting pain. Some primary care physicians may also refer the patient on to other specialties/practitioners or alternative care therapists.

The assessment and diagnosis phase can take 6 -12 months or more. If surgical assessment/ intervention is required, when all diagnostic assessments have been exhausted and if no clear clinical diagnosis has been ascertained, the primary care physician will refer the patient to an orthopedic surgeon, often without differentiating a shoulder subspecialist.

Specialty Care –Orthopedic Shoulder Specialist:

The patient's care pathway with the orthopedic surgeon includes a detailed clinical encounter and review of the pertinent imaging. Unfortunately, there is often a need to repeat diagnostic assessments due to the prolonged time lapse between the date of referral to the surgeon and the actual date of consult. In addition, poor quality studies e.g. ultrasound, is another cause for requesting a repeat study. Finally, orthopaedic surgeons often request new studies such as MRI because either the initial studies were inconclusive or inappropriate for confirmation of the diagnosis. The expertise and clinical experience of the orthopedic surgeon allows for an accurate and timely diagnosis of the patient's symptoms and clinical findings on the first encounter. For approximately 80% of these patients, an initial trial of conservative treatment would include a recommendation for exercise/physiotherapy, NSAIDs and or cortisone injection followed by 6-12 weeks of recovery time and a follow-up visit. For the remaining patients, surgical intervention would be required. Most often these procedures are performed as day surgery.

Specialty Care – Post Surgical Intervention:

Post procedure patients (with shoulder replacement, frozen shoulder release or complex open rotator cuff repairs/salvage procedures (tendon transfers), or complex open stabilizations) require catheter pain management for 6 consecutive days, which is currently provided on contractual basis through the Community Care Access Centre (CCAC) organization. Patients are also advised to complete 6-24 weeks of physiotherapy at RVA or through an external provider of their choice. Follow up consultation, if required, is completed at the orthopedic surgeon's office within 6 weeks of treatment.

Issues with current care pathway:

During the course of the PCP's attempt to arrive at an accurate diagnosis, the PCP will routinely order x-rays, ultrasounds and recommend a course of physiotherapy within the first month. When the patient does not improve, the PCP usually requests an orthopedic surgeon assessment. However, the time for an orthopedic consult remains excessively long, thus lengthening the time the patients' shoulder complaint remains under the care of the PCP. This delay results in additional costly (and often unnecessary) testing (especially MRI) due to PCP trying to

determine the underlying problem and pressure from the patients who often feel that MRI is required for appropriate diagnoses of their shoulder pain.

Patients will also seek assessments and treatment from multiple providers including Chiropractors, Massage therapist, Acupuncturists and Osteopaths. Finally, both PCP and patients experience growing frustration with the low level of improvements being achieved. Under the current state pathway, the assessments and diagnosis phase can take between 3 and 15 months for patients before they are ultimately diagnosed for by an Orthopedic surgeon.

Recent research has shown that MRI testing, completed for almost 50% of patients presenting with shoulder symptoms, cause a delay in diagnosis and are not clinically required for accurate prognosis of shoulder pain. The incorrect medical investigations burden the healthcare system with significant barrier to timely access and unnecessary expenses. Recent reports suggest that every 1 percent conversion of MRIs to ultrasound can equate to $1 million in cost savings for the health care system (Kissenberth &Thigpen, 2014).

Identified Improvement Opportunities:

As noted above, significant improvement opportunities exist within the patient's journey from initial assessment until referral for surgical consult. Identified wastes in the system are due to, but not limited to, the following:

- Lengthy wait times for primary care
- Delays in treatment due to constrained access
- Circuitous visits for review of diagnostic results
- Unnecessary diagnostic imaging
- Exposure to ineffective medical treatments
- Patient and physician dissatisfaction
- Incorrect match of care providers to patient needs

Further improvements can also be made to the patient's surgical pathway milestones:

- Development of a multi-disciplinary Orthopedic Care Team (OCT)
- Rehabilitation programs including non-operative patient group therapy and pre-op/postop-rehabilitation group therapy
- Pain management (including home catheters)
- Education program for primary care physicians on early diagnosis for key shoulder diagnosis related groups (DRG) and post discharge follow ups

These system wastes restrict access, decrease customer value and demonstrate the importance of integrating high quality care. Guidelines for referral and standard treatment pathways are essential to contain costs and ensure patients receive the most appropriate and effective treatment, whilst providing value for the public funds.

The increasing access constraints and disparity in service provision need to be tackled by an integrated care plan. Care providers, orthopedic surgeons, GPs and allied health, need to work closely together in both the primary and secondary care setting to ensure effective and cost efficient care for the patients.

Baseline Data for Target Population in Current State:

Currently there is a sufficient gap in operational and financial performance reporting available to health providers, specifically for shoulder treatments. As such, current baseline data figures are based on health provider's estimates of service utilization. Baseline information and clinically acceptable targets need to be established for shoulder pain on the following metrics:

1) Visits to Primary Care Physicians for shoulder pain complaints
2) Diagnostic referrals for:
    a. X-rays
    b. Ultrasound
    c. MRI/CT
3) Average duration of physiotherapy completed prior to consult with Orthopedic surgeon
4) Patient referred for each treatment option:
    a. Physical Therapy
    b. Non-Surgical Intervention
    c. Surgical Intervention
5) Average duration of physiotherapy completed after surgical intervention
6) Number of patients receiving community care rehabilitation services

3. Opportunities for Improvement

The proposed care pathway encompasses an integrated shared-care model, consisting of a clinical hub and community satellite structure, designed to resolve the barriers in patient access to appropriate provider and treatment as well as decreasing duplication of specialized diagnostic tests. This will improve timeliness, efficiency and effectiveness in patient care and decrease system costs.

Implementation of the proposed model of care within a hub and satellite structure, providing service and system improvements, is dependent on the establishment of the following components:

1) Implementation of a regional shoulder program hub at RVA, comprising of a multi-disciplinary clinical team for the integrated shared-care model.
2) Implementation of local community satellites within defined catchment areas, that serve as mirror images of The Shoulder Centre hub by replicating the same patient care processes and care pathways to provide shoulder care services within local communities.
3) Network of family physician practices and PCPs that have a formalized agreement defining the terms of care management for shoulder patients and if required referral of patients to The Shoulder Centre for specialized care.

The mechanisms proposed in the hub and satellite shoulder care model to improve the management of shoulder pain are:

1) Implement evidence based guidelines for referral and treatment pathways to provide appropriate care while maintaining costs
2) Increase communication and coordination among providers across the continuum of care
3) Transition service volumes towards more coordinated, reliable care with effective health outcomes.
4) Ongoing education of the provider network.

These strategies restructure patient care for shoulder pain and can easily be scaled to other DRG's.

Shoulder Care within Community Shared-Care Satellites:

The proposed pathway is triggered when a patient with shoulder pain contacts a family physician in a community shared-care satellite. The primary care physicians will be provided with and educated on how to use a specialized 'Shoulder Screening Checklist' designed by The Shoulder Center's clinical team at RVA. This checklist will serve as an assessment tool to determine the patient's clinical needs and whether or not a shoulder specialty assessment is required. If the PCP's assessment supports referring the patient for further evaluation, the patient will be sent next to a shoulder specialist within their local community. This specialist will in fact be a PCP who has received advanced shoulder training from The Shoulder Centre team in order for them to be designated as a local shoulder care champion. The champion will possess a greater understanding of shoulder disorders and thus an ability to manage such patients locally or if necessary the knowledge of when to refer the patients for even further specialized care at The Shoulder Centre.

Implementing the new care pathway will eliminate the need for advanced diagnostic testing beyond X-ray and ultrasound at the primary care provider's point of contact. The model's strategy is to transition, and ultimately reduce, the need for advanced diagnostic testing (such as MRI) currently completed by the family physician to the discretion of either the shoulder champion or the hub's clinical team specialists.

The outcome will be a significant reduction in the patient's time to appropriate care, resulting in increased patient satisfaction, reduction in unnecessary medical assessments and improved access for limited specialized resources (MRI) to more clinically appropriate assessments.

Shoulder care within The Shoulder Center hub – Non-surgical management:

When patients are referred to The Shoulder Center hub, the multi-disciplinary clinical team will provide the best-matched provider based on the triaging of the e-referral. The selected provider will then perform an assessment and complete an immediate treatment plan, for physical therapy, injection or surgeon assessment

Shoulder care treatment options within The Shoulder Center hub are the same as the current state; however through appropriate diagnosis and symptom management, the proportion of patients being identified for each care pathway may differ. Earlier detection of the cause of one's shoulder pain can result in symptom resolution through physical therapy, whereas accurate diagnosis of more severe cases can increase the surgical conversion rate within recommended mean wait times without trialing in-effective treatment therapies in the interim.

Shoulder care within The Shoulder Center hub – Post surgical intervention:

RVA will provide patients with the choice of enrolling into a rehabilitation program offered on-site at RVA or in the community through contracted physiotherapy providers or group physiotherapy provided at the community satellites and monitored by the local shoulder care champion. RVA have designed rehabilitation guidelines and care plans to ensure that service variances are eliminated through standardized protocols. In addition, RVA will also provide patients with education on rehabilitation maintenance. The intended goal of the regional shoulder program is to resolve non-surgical occurrences within 6-12 weeks of initiation of therapy without the need for further assessments and possible investigation with an MRI. Patient's progress towards health improvement will be assessed every 4 weeks, allowing timely adjustments to the treatment plans.

The patient and primary care provider will be made active participants in the care plan allowing facilitation of informed treatment choices, which will improve the patient's satisfaction and health outcomes. System improvements through regionalized coordination and reduction of redundant tests will allow for better access to evidence-based treatments.

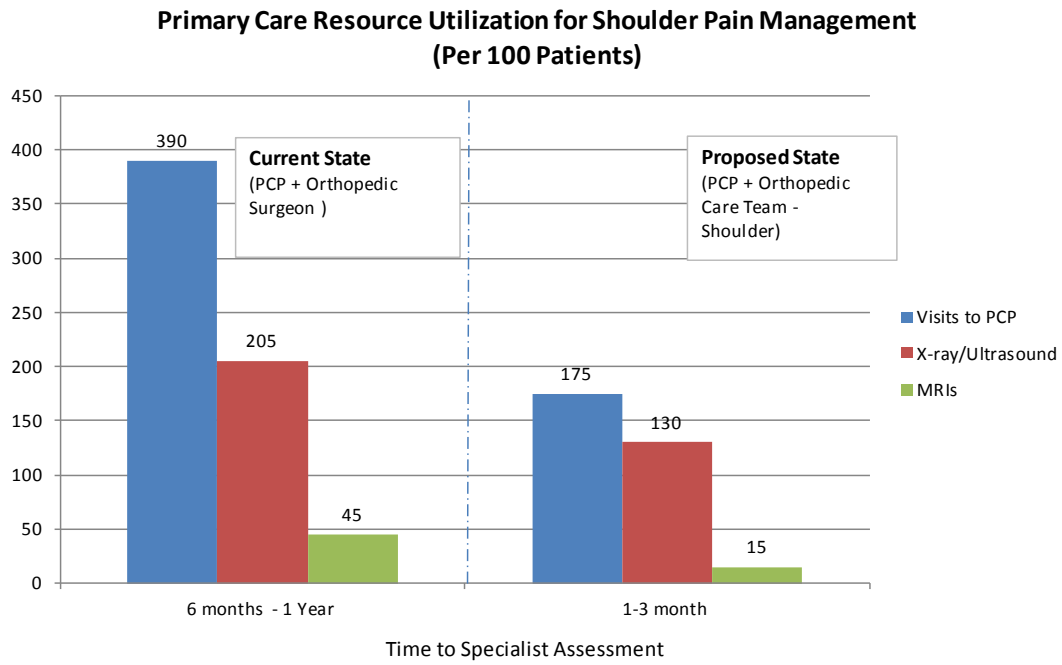
Improvements Made Through the New Model

The transformed care plan streamlines the patient's encounter using standardized treatment pathways based on the patient's physical assessment and can thus lead to a more predictable prognosis. The process is designed to drive quality of care improvements and enhance access to services by limiting specialized care until warranted. Key improvements realized through the implementation of the proposed model of care are:

- ✓ Expanded patient access
- ✓ Elimination of circuitous visits to primary care physicians.
- ✓ Reduction of unwarranted shoulder investigations especially MRI.
- ✓ Expedited referrals
- ✓ Clinical system integration for pre/post care
- ✓ Reduced assessment, diagnosis and recovery periods
- ✓ Improved surgical conversion rates
- ✓ Appropriate use of surgical resources
- ✓ Improved patient satisfaction
- ✓ Increased patient involvement in care planning
- ✓ Reduced system and patient costs
- ✓ Evidence based standardized care plans
- ✓ Integration of community providers
- ✓ Service availability within local communities
- ✓ Expansion of specialized clinical skills to other providers
- ✓ Management of patients clinical needs with the most appropriate care provider

Figure 3 provides an illustration on the estimated/expected change in primary care utilization for shoulder pain management under the new model. The implementation of an Orthopedic Care Team significantly reduces visits to primary care providers and the use of MRI in the assessment of shoulder discomfort.

Figure 3: Proposed Care Model Timelines and Cost Distribution



4. Transformed Shoulder Care Model

Under the transformed integrated care model healthcare system savings will be realized from:

1) Reduced visits to family physicians
2) Reduction of unnecessary medical assessments
3) Reduction in the number of radiologic assessments especially MRI
4) Early diagnosis and OCT treatment potentially reducing the need for surgical procedures
5) Efficient management of patients clinical needs

Examples of the outcome measures to be captured for evaluation of program performance and system improvements are:

- Annual patient volumes to the local champion and regional shoulder program
- Average wait time for appointment to a shoulder expert (T1)
- Number of MRIs required for shoulder program patients
- Surgical conversion rate
- Percentage of patient distribution in treatment categories (physical therapy, non-surgical treatments and surgical interventions)
- Percentage of patients requiring community rehabilitation services
- Average number of physiotherapy sessions completed by patients
- Quality of life and disease specific patient reported outcome measures

Conclusion

Evidence-based medicine and the implementation of integrated care pathways offer better and more predictable outcomes in patient care at lower costs. The transformed model of care including The Shoulder Center Hub and Shared-Care Community Satellites will deliver better and more consistent shoulder care management decisions, higher return on investment and better system value for stakeholders. Performance and financial data comparisons resulting from the project in the current and proposed state will demonstrate these added benefits to the patients and the system. The transformed model of care is designed to generate significant benefits and savings to the health system.

Acknowledgements

Amelia McCutcheon, BSc, MSc, PhD
Vice-president, RVHS Surgical Program
Rouge Valley Health System

Glyn Boatswain, BSc
Interim Director, RVHS Surgical Program

Jennifer Collins, BA
Special Projects Officer, RVHS Foundation