Multidisciplinary Care Model

Integrated Spine Service: Putting Value into Back Pain Care

Conor O'Neill, MD
NASS Value Committee
University of California–San Francisco
San Francisco, CA

Patricia Zheng, MD
University of California–San Francisco
San Francisco, CA

Introduction

Back and neck pain are highly prevalent and costly. Both prevalence and costs are rising.[1–3] Increasing expenditures have not led to improvements in functional limitations in patients with spinal pain.[4,5] An analysis of a nationally representative survey in the United States demonstrated that between 1997 and 2005, the average medical costs for patients with neck and back problems rose from $4,695 to $6,096 as compared to $2,731 to $3,516 for patients without neck and back problems. At the same time, the proportion of patients with neck and back pain reporting physical functioning limitation increased from 20.7% to 24.7%.[6]

Fragmentation of care contributes to rising costs and worsenings.[7] When a patient has back pain that is difficult to manage, primary care providers (PCPs) often refer them to a variety of specialists. Patients may see separate providers for pain management, functional evaluation and physical therapy at different institutions and these providers are unlikely to communicate with each other. Unnecessary tests are ordered or worse, even repeated. The lack of an organized plan can leave the patient lost and confused.

Recently, we have seen a push to develop integrated care models where providers from multiple disciplines work together to actively comanage patients with spinal pain. Such efforts have been shown to decrease costs (including utilization of advanced imaging and surgery) and improve outcomes. The Excellus pathway has served as a model for our effort. Excellus Blue Cross/Blue Shield is a health plan that serves upstate New York. In a pilot study they instituted a spine pathway at a primary care clinic site facilitating the referral to a therapist, physician and psychological support. Another primary care clinic within the network served as a control. In the spine pathway clinic, fusion surgery utilization decreased by 79%, imaging utilization by 66% and opioid utilization by 34%. Overall, the spine pathway clinic had a 28% reduction in direct costs related to low back pain over a year, while the control clinic saw an 8% increase. A manuscript describing their experience is under review and they are in the process of rolling this program out to other clinics in their network.

Given these exciting pilot results, integrated care models have been proposed to improve care, improve outcomes and reduce costs by creating a patient-centered medical home.[8] At the University of California–San Francisco (UCSF), we created an Integrated Spine Service (ISS) where PCPs can comanage patients with chronic neck and back conditions with a group of physiatrists, physical therapists and pain management specialists in an effort to improve care and decrease costs. To complement clinical care, the program developed a collection of print and online materials. In this article we describe our experience in establishing an integrated care model at our medical center and present the pilot outcomes from our first two years. These data demonstrate that an integrated care model can decrease costs while improving outcomes.

Development and Description of the Integrated Spine Service

ISS was developed at UCSF as part of a multidisciplinary, cross-department effort funded by the Caring Wisely program launched by the UCSF Center for Healthcare Value. This program is an effort by UCSF to support clinician efforts to remove unnecessary costs

from health care delivery systems and improve the quality of care delivered. The program awarded $50,000 annually for two years to the development of ISS and provided invaluable support in obtaining hospital administration backing and guidance from experienced program leaders and design experts from the Clinical Innovation Center. After initial operational analysis of current practices at UCSF and review of prior successful efforts at other sites, it was clear to the ISS team that we had a need to (1) overcome existing departmental boundaries to allow clinicians and therapists to see back pain patients at the same time to foster increased communication, (2) standardize ISS patient education resources to provide patients a consistent message about back pain, (3) standardize clinician documentation to improve communication with PCPs and (4) establish existing quality improvement efforts by tracking standardized outcomes in patients who undergo ISS.

Historically, PCPs at UCSF referred back pain patients separately and sometimes simultaneously to physical therapy, orthopedic surgery, neurosurgery or pain management specialists in the anesthesia and perioperative care departments. Coordination of care between the specialists in these departments was minimal. The development of ISS required significant negotiations among the different departments to create a joint clinic space and time where physiatrists and pain management specialists could see patients at the same time with physical therapists. We reached agreements with our surgical colleagues on how surgical referrals would be distributed. Eventually, a new referral system was set up that allows PCPs to directly refer patients to ISS. Patients are scheduled for back-to-back one-hour appointments with the physical therapist and 30 minutes with a clinician at the same site to allow for cross-discussion between the therapist and the clinician, and the establishment of a consistent care plan that can be jointly relayed to the patient. Furthermore, monthly staff meetings were established to continuously review patient progress.

With design experts from the Clinical Innovation Center, we created a set of standardized print and online resources for the patients (**Figure 1**). These resources describe etiologies of back pain and evidence-based treatment options, using a pain neuroscience education foundation. A workbook further described self-help strategies patients can pursue themselves to help manage their own back pain. A website was created to provide patients access to such information remotely. PCPs can refer patients to these resources prior to the first scheduled ISS visit. This effort sought to standardize the message presented to patients about back pain.

Given the disjointed care patients historically received at UCSF, it became apparent that documentation differences between departments created confusion to nonspecialists. As part of the ISS effort, we also developed a standardized template for clinicians to adopt. This template encouraged specific wordings of possible structural etiologies of pain and also psychosocial factors that may predispose patients to poor outcomes. The template prompted clinicians not only to discuss medications and procedures, but also to emphasize the role of physical therapy, self-care strategies and psychotherapy. This change in documentation improved communication with PCPs and reminded the ISS clinicians to adopt an integrated approach to care.

Finally, it was clear from the beginning that establishment of a successful ISS effort required iterative improvement. To allow proper quality improvement efforts, we enforced standardized measurement of the StarTBack Screening tool at presentation to ISS for prognostication purposes. StarTBack was particularly chosen as prior studies have shown its ability to accurately stratify patients with back pain.[9] High-risk individuals were tracked and marked for discussion at ISS monthly staff meetings. All patients were administered the PROMIS global questionnaire chosen specifically for its ease of use with just 10 questions and recent recommendations from consortiums.[10] To standardize outcome reporting in clinical trials of patients with nonspecific low back pain, an international multidisciplinary panel recommended physical functioning, pain intensity and health-related quality of life (HRQoL).

Through the collaborative efforts of the different departments, ISS clinics first started to see patients in July 2017.

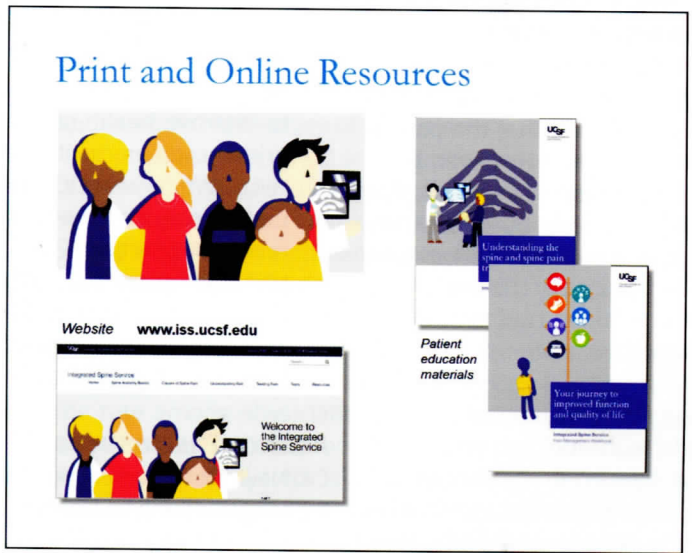

Figure 1. Standardized resources for patients describing etiologies of back pain, evidence-based treatment options and self-help strategies to help manage their pain.

ISS Episode Costs and Clinical Outcomes from 2017 to 2019

From July 2017 to June 2019, the ISS program saw 104 patients. To evaluate the success of this program, we looked to see if (1) ISS can decrease the episode care cost as compared to traditional spine specialist care and (2) whether PROMIS 10 measures improved in these patients over time.

We defined back pain episode care cost as 180-day direct costs to the medical center including all clinic visits, imaging, procedures and surgeries performed for back

pain from time first seen by a PCP for a new episode of back pain. Care costs were calculated for patients who were seen in ISS and compared to those seen in the traditional spine specialist clinic. We also calculated the cost of those patients with back pain who were not referred to specialty care by the PCP. At the end of two fiscal years, our data included 104 ISS care episodes and 581 traditional spine specialist care services (**Table**). The 180-day episode direct cost for patients who were not referred by PCP was the lowest at $717. The cost for those seen in ISS was $3,169, and $4,499 in those seen by spine specialists. The difference in costs can be attributed to the lower conversion rate to surgery in the ISS patients. Further analysis including risk adjustment modeling is needed to see what is contributing to the lower conversion rate.

Table. Back Pain Episode Care for ISS and Non-ISS Patients

Clinician(s)	Visit Type	Cases	Direct Cost
Integrated Spine Service	No surgery	101	$2,703
	Spine surgery	3	$18,855
	Total	104	$3,169
Spine Specialist	No surgery	546	$2,762
	Spine surgery	35	$31,598
	Total	581	$4,499
PCP Only (no specialist care)		2,781	$717

Data collection was quite successful at initial visit. However, because of limited resources to enforce collection of outcome data at subsequent visits, we had very limited follow-up outcome data in this population. Only 21 patients discharged from ISS completed a pre- and post-PROMIS global score. Of these, the patients on average demonstrated a 10% increase in PROMIS global Physical Health scores and a 5% increase in PROMIS global Mental Health scores.

In addition to cost and outcome data, PCP, ISS provider and patient satisfaction have been assessed using traditional surveys; all score highly.

Discussion and Future Directions

Through a multidisciplinary, cross-department effort, we transcended historical fragmentation to create an Integrated Spine Service. Preliminary data suggest that a coordinated care system for back pain can decrease episode care costs and improve patient outcomes. We are expanding service capacity and plan to conduct more rigorous studies of the impact of the program, which include risk-adjustment models. A particular focus will be on improving capture of outcome measurements, including using digital tools that the patient can conveniently access outside of the clinic. However, given that this effort demonstrates a simple restructuring of spine care delivery can decrease episode care costs by 30%, we believe an integrated care model can add the value back in back pain care.

References

1. Dagenais S, Caro J, Haldeman S. A systematic review of low back pain cost of illness studies in the United States and internationally. *Spine J.* 2008;8:8–20.
2. Hogg-Johnson S, van der Velde G, Carrol LJ, et al. The burden and determinants of neck pain in the general population. *Eur Spine J.* 2008;17:39–51.
3. Hoy D, March L, Brooks P, *et al.* The global burden of low back pain: estimates from the Global Burden of Disease 2010 study. *Ann Rheum Dis.* 2014;73:968–974.
4. Becker A, *et al.* Low back pain in primary care: costs of care and prediction of future health care utilization. *Spine.* 2010;35:1714.
5. Mafi JN, McCarthy EP, Davis RB, Landon BE. Worsening trends in the management and treatment of back pain. *JAMA Intern Med.* 2013;173:1573–1581.
6. Martin BI, Deyo RA, Mirza SK, et al. Expenditures and health status among adults with back and neck problems. *JAMA.* 2008;299:656–664.
7. Dagenais S, Tricco AC, Haldeman S. Synthesis of recommendations for the assessment and management of low back pain from recent clinical practice guidelines. *Spine J.* 2010;10:514–529.
8. Goertz CM. Weeks WB, Justice B, Haldeman S. A proposal to improve health-care value in spine care delivery: the primary spine practitioner. *Spine J.* 2017;17:1570–1574.
9. Hill JC, Whitehurst DG, Lewis M, et al. Comparison of stratified primary care management for low back pain with current best practice (STarT Back): a randomised controlled trial. *The Lancet,* 2011;378:1560–1571.
10. Chiarotto A, Boers M, Deyo RA, et al. Core outcome measurement instruments for clinical trials in nonspecific low back pain. *Pain.* 2018;159:481–495.

Author Disclosures

C O'Neill: Stock Ownership: Relievant (0.17%), Nocimed (0.70%).
P Zheng: Nothing to disclose.