



# Quality Improvement in the Department of Orthopaedic Surgery in the University of Pennsylvania Health System



Joshua Gordon, MD, Finnah Pio, Alex Neuwirth, MD, Eric Hume, MD

With the works of Berwick, Deming, Porter, Teisberg, Donabedian and many others there has been an increasing focus on quality in medicine, not only as an important means to improving the delivery of care, but potentially as a metric dictating much of what we, as physicians, do. This past academic year Penn Orthopaedics has taken significant steps to strengthen the department's already robust quality improvement program. The department has targeted multiple facets of quality improvement with several key initiatives on the clinical front including reducing postoperative complications and readmissions while simultaneously attempting to integrate these directly into resident education, departmental procedures and the culture of our department.

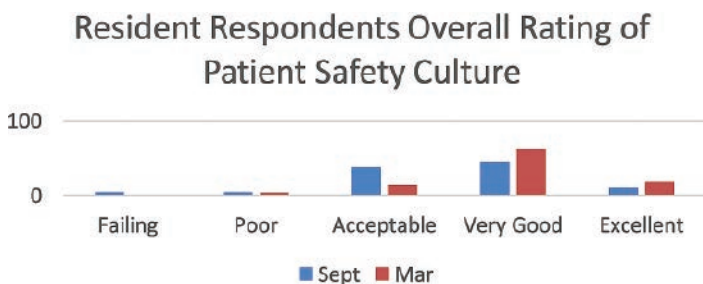
This year marked the creation of the Penn Orthopaedic Quality Improvement Council and a concomitant formal curriculum focused on quality improvement to complement our ongoing morbidity and mortality conference. The aim of this curriculum is to develop resident expertise in quality improvement beyond a basic understanding, while continuing to foster a culture in which stepwise and continual progress is actualized. The Quality Improvement Council is responsible for organizing and improving the quality improvement curriculum and implementing a quarterly review of clinical progress. The associated conferences are structured to cover principles of the improvement process, expose the department to leaders in the field of quality improvement and generate discussion surrounding specific and ongoing improvement projects. We have already begun to observe significant cross-pollination of ideas within the department from different sub-divisions and individuals with varying areas of expertise.

Perhaps the most innovative portion of the conference involves having residents propose projects; these proposals are then opened to the conference floor for discussion. This process allows those on the front lines of care, including

the department leaders, to discuss how projects can best be analyzed, evaluated and implemented, a method that leads to a detailed and organic instruction in project design. We are in the process of measuring the impact of this conference, but anticipate an associated cultural shift and an improvement in quality of the departmental output. To date we have had proposals including improved C-arm use efficiency, improvement in timing of consult execution in the emergency department, improvement in communication between our department and other care providers, and improvements in discharge planning. Some of the proposals have continued on to more robust process improvement projects, while others have simply served as instructive exercises for the younger residents.

Upon completion of the first academic year of these quality improvement conferences we took the opportunity to survey the residents regarding their perceptions of quality improvement in the department. Although results are preliminary and require more thorough evaluation we found a general improvement in understanding of quality improvement processes, the perceived involvement of our department in quality improvement exercises, and our perceived overall grade on patient safety (see fig 1). As an extension of our conference we anticipate continuing to monitor the impact of our conference and apply the same quality improvement processes we are teaching to improving the quality of the conference itself.

We are thankful for the work of the founding members of the Quality Improvement Council; Joshua Steere, Joshua Rozell, Ryan Charette, Blair Ashley and Alex Neuwirth have all made significant contributions to realizing some of these changes over the past year. We are also very grateful to Dr. Eric Hume, our superb faculty leader, and Finnah Pio, an expert in quality improvement, who has helped guide many of these changes across the department. As a group, we are all eager to continue work on this fledgling effort, and have been extremely excited to see it take flight while looking forward to seeing what progress it can foster.



**Figure 1.** Overall rating given to the department of Orthopaedic Surgery regarding patient safety as measured by a survey given once in September prior to institution of the quality improvement conference and after the first academic year of conference participation.

## References:

1. McCarthy DM, Boardman ND, Tramaglino DM, Sotereanos DG, Herndon JH. Clinical management of partially lacerated digital flexor tendons: a survey [corrected] of hand surgeons. *J Hand Surg Am.* 1995 Mar;20(2):273-5.
2. Haddad R, Scherman P, Peltz T, Nicklin S, Walsh WR. A biomechanical assessment of repair versus nonrepair of sheep flexor tendons lacerated to 75 percent. *J Hand Surg Am.* 2010 Apr;35(4):546-51.
3. al-Qattan MM. Conservative management of zone II partial flexor tendon lacerations greater than half the width of the tendon. *J Hand Surg Am.* 2000 Nov;25(6):1118-21.

4. **Balk ML, Sotereanos DG.** Partial flexor digitorum profundus lacerations. *Oper Tech Orthop* [Internet]. Elsevier; 1998 Apr 4 [cited 2015 Aug 31];8(2):67–72.
5. **Okano T, Hidaka N, Nakamura H.** Partial laceration of the flexor tendon as an unusual cause of trigger finger. *J Plast Surg Hand Surg.* 2011 Sep;45(4-5):248-51.
6. **Kim HR, Lee SH.** Ultrasonographic assessment of clinically diagnosed trigger fingers. *Rheumatol Int.* 2010 Sep;30(11):1455-8.
7. **Tat J, Kociolek AM, Keir PJ.** Validation of color Doppler sonography for evaluating relative displacement between the flexor tendon and subsynovial connective tissue. *J Ultrasound Med.* 2015 Apr;34(4):679-87.
8. **Korstanje JW, Schreuders TR, van der Sijde J, Hovius SE, Bosch JG, Selles RW.** Ultrasonographic assessment of long finger tendon excursion in zone v during passive and active tendon gliding exercises. *J Hand Surg Am.* 2010 Apr;35(4):559-65.
9. **Wu TS, Roque PJ, Green J, Drachman D, Khor KN, Rosenberg M, et al.** Bedside ultrasound evaluation of tendon injuries. *Am J Emerg Med.* 2012 Oct;30(8):1617-21.
10. **Soubeyrand M, Biau D, Jomaah N, Pradel C, Dumontier C, Nourissat G.** Penetrating volar injuries of the hand: diagnostic accuracy of US in depicting soft-tissue lesions. *Radiology.* 2008 Oct;249(1):228-35.
11. **Zhang GY, Zhuang HY, Wang LX.** Value of high frequency ultrasonography in diagnosis and surgical repair of traumatic finger tendon ruptures. *Med Princ Pract.* 2012;21(5):472-5.