"Red-Yellow-Green": Effect of an Initiative to Guide Surgeon Choice of Orthopaedic Trauma Implants

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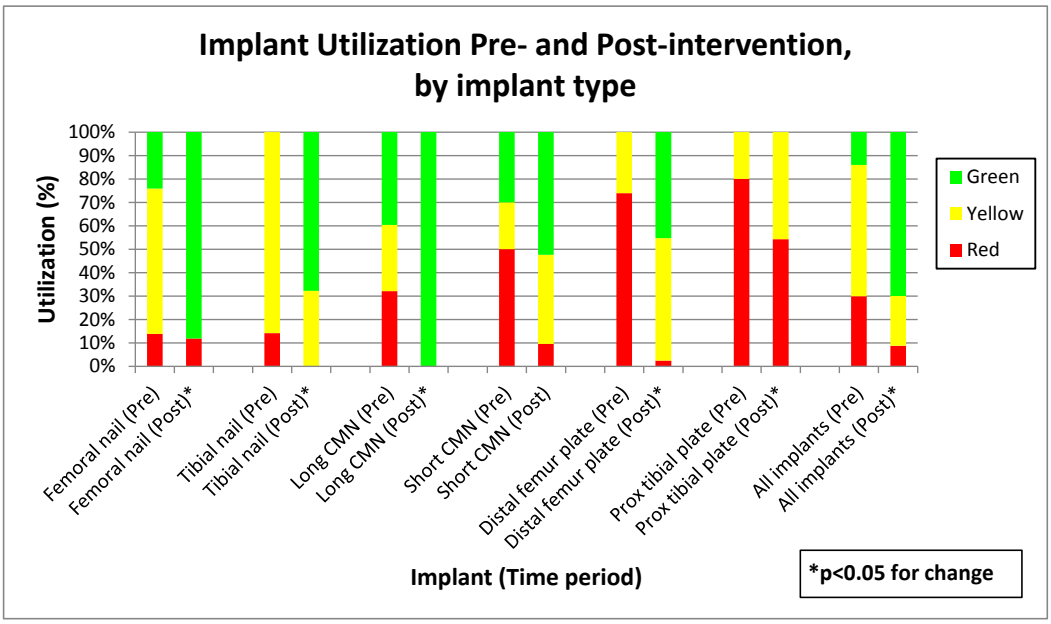
Purpose: Orthopaedic procedures are expensive, and devices account for a large proportion of the costs. While there is little evidence for the clinical superiority of one vendor's product over another, the prices for these items often differ substantially. Hospitals have employed a variety of strategies to decrease implant costs, but many of them center on restricting surgeons' choice of implants. At our institution, we developed and implemented an implant selection tool ("Red-Yellow-Green") that guides surgeons toward more cost-effective implants, while minimally restricting choice. The purpose of this study was to assess the effect of this tool on preferred implant usage rates, vendor attitudes towards pricing structure, and hospital implant expenditures.

Methods: Six orthopaedic trauma devices in common use at our hospital were selected (femoral intramedullary nail, tibial intramedullary nail, short cephalomedullary nail, long cephalomedullary nail, distal femoral plate, and proximal tibial plate). For each type of device, the product offered by each of the 4 vendors in use at our hospital (Smith & Nephew, Stryker, Synthes, and Zimmer) was analyzed. For each device type, similar constructs were created for each of the 4 vendors' products, and the costs determined. On the basis of these costs, the available options for each device type were categorized as Green (preferred vendor), Yellow (mid-range), or Red (use for patient-specific requirements). The result was "Red-Yellow-Green," a chart which was posted on the wall of each orthopaedic trauma operating room in April 2013. Following the initial posting of the chart, the 4 vendors supplying implants to our hospital indicated a desire to renegotiate their contracts with the institution. After finalization of the new contract prices, the "Red-Yellow-Green" chart was revised and reposted in the operating rooms in August 2013. To assess the effect of the implant guidance tool, we compared implant usage patterns in the 12 months preceding the initial posting (Period 1; 3/2012-3/2013) and the 12 months following the revised posting (Period 2; 9/2013-9/2014). We also assessed changes in vendor contract prices, as well as overall savings to our institution. All elements of the study were approved by the University of Maryland Institutional Review Board.

Results: Patient demographics and the types of procedures performed were similar between Period 1 (preintervention) and Period 2 (postintervention). Overall implant usage patterns changed significantly from 30% Red, 56% Yellow, and 14% Green prior to the intervention to 9% Red, 21% Yellow, and 70% Green following the intervention ($P < 0.0001$; Figure). As a result of price renegotiation with vendors following implementation of "Red-Yellow-Green," we observed average price decreases ranging from 1.1% to 22.4% for the 4 vendors in question. Due to increases in preferred vendor usage by the surgeons and decreases in implant prices by the vendors, hospital expenditures on the 6 implants decreased 20% from

Period 1 to Period 2, which represented a savings of $216,495 per year to our institution on these implants alone.



Conclusion: At our institution, we designed and implemented "Red-Yellow-Green," a simple tool that guides surgeons toward the selection of lower cost implants without violating vendor confidentiality clauses, limiting the implants from which surgeons can choose, or requiring surgeons to discern the prices of complex constructs. Following implementation, hospital expenditures for these implants decreased due to a combination of increased preferred vendor usage by surgeons, who were guided by the cost information presented in this simple tool, as well as increased competition among vendors, which resulted in lower overall prices.

See pages 49 - 106 for financial disclosure information.