Resident Perceptions of Autonomy in a Complex Tertiary Care Environment Improve When Supervised by Hospitalists

abstract

BACKGROUND AND OBJECTIVE: Increasingly, academic hospitals have adopted hospitalist-based systems of inpatient pediatric care. Some studies comparing hospitalists with other attending physicians have suggested trainees are more satisfied with education from hospitalists. However, there are published concerns that the increased presence of hospitalists may reduce residents’ autonomy. The objective of the current study was to evaluate pediatric residents’ perceptions of their own autonomy after a broad ward restructuring to hospitalist-led teams.

METHODS: We analyzed data from standardized attending evaluations before and after a pediatric ward restructuring at an academic tertiary care hospital. Provision of most inpatient pediatric care changed from subspecialist-led teams to hospitalist-led teams. Numerical scores from evaluations before and after the restructuring were compared quantitatively. Comments from the evaluations were analyzed qualitatively to identify key themes.

RESULTS: Before the restructuring, there were 65 evaluations of 5 hospitalists and 602 evaluations of 32 subspecialists. After the restructuring, there were 188 evaluations of 8 hospitalists. Hospitalists were rated significantly higher on all teaching attributes compared with all attending physicians before the restructuring. The attending role in promoting autonomy was mentioned infrequently and reflected residents’ perceived lack of autonomy before the restructuring. The primary theme after the restructuring was autonomy, specifically emphasizing resident leadership and decision-making and the appropriate balance of resident autonomy and supervision.

CONCLUSIONS: Although patient complexity was unchanged, a comparison of numerical ratings and resident comments before and after the restructuring indicates that hospitalists lead teams differently from subspecialists, with more emphasis on resident decision-making and autonomy.

INTRODUCTION

Resident autonomy, defined as progressive independence in patient care, is a core tenet of clinical training. The Accreditation Council of Graduate Medical Education requires that residents demonstrate increasing autonomy over the course of training, developing progressive responsibility and leadership skills under faculty guidance. Trainees, under supervision, develop knowledge and professional skills to become competent independent clinicians. However, the economic pressures of implementing cost-effective health care, increased emphasis on patient safety,
and duty hour regulations threaten to diminish functional independence and resident autonomy.\textsuperscript{2,3} In addition, the increasing proportion of hospitalized children with complex health care needs creates a work environment that demands efficiency, continuity, and coordination of care.\textsuperscript{4} All of these factors have the potential to reduce resident autonomy and compromise learning opportunities.\textsuperscript{5,6}

A growing number of academic medical centers have expanded pediatric hospitalist-based systems of care.\textsuperscript{7–9} In these settings, hospitalists are charged with 2 roles: (1) leading the care of medically complex children; and (2) teaching house staff and students. Studies comparing hospitalists with other attending physicians as teachers suggest that trainees are generally more satisfied with their education from hospitalists.\textsuperscript{10–12} Given their greater availability, hospitalists have a unique opportunity to mentor residents and observe patient encounters compared with subspecialists, who typically conduct rounds in the morning, then leave the inpatient ward to treat patients in the clinic.\textsuperscript{13} Yet, because of their increased presence, there have been published concerns that hospitalists might reduce resident autonomy and opportunities to make independent decisions.\textsuperscript{9,14–16}

At University of California, San Francisco (UCSF) Benioff Children’s Hospital, the inpatient pediatric ward was recently restructured to create hospitalist-led teams to care for both general and specialty medical patients. Before the change, pediatric subspecialists were the primary inpatient attending physicians for patients with complex medical conditions. A survey completed by the residents before the restructuring indicated considerable apprehension about the impact of hospitalists on resident autonomy, paralleling the published concerns.\textsuperscript{9,14–16} This concern existed despite the fact that residents historically rated hospitalists highly on promoting autonomy. The objective of the current study was to evaluate pediatric residents’ perceptions of their own autonomy after a broad ward restructuring to hospitalist-led teams.

**METHODS**

**Site and Participants**

All pediatric residents at UCSF were eligible to participate in the study. The residents consented to participate in the research project evaluating how the restructuring process affected their educational experience. The UCSF Committee on Human Research approved the research protocol.

**Description of Ward Restructuring**

In September 2008, the UCSF pediatric residency training program restructured the pediatric ward. The new structure was created by a committee of faculty and residents who responded to dissatisfaction with the existing structure. In the preceding 5 years, the average daily census had increased, and patient complexity had remained high. The ward restructuring was designed to increase attending presence, equalize patient distribution between teams, create more consistent physician-to-patient ratios, and conform to resident duty hour restrictions.

The primary change involved a transition from specialty-specific teams to hospitalist-led teams. Pediatric inpatients who were previously cared for by subspecialist attending physicians were placed on hospitalist teams, with subspecialists moving to a consulting role. Previously, each ward team would conduct rounds with 3 different subspecialty attending physicians each day. One team cared for a subset of general pediatric patients led by a hospitalist, in addition to patients on 2 other subspecialty services. The new system included 2 hospitalist teams plus a separate team for patients receiving dialysis or who had received either a kidney or liver transplant. Hospitalist attending physicians had no outpatient duties and were present and available throughout the day.

A day–night team structure was also implemented, replacing a traditional call schedule requiring 30-hour shifts. Within the new structure, residents worked 1 week of night-shifts and 3 weeks of day-shifts during each month. The night team included 1 senior resident and an intern from each of the 2 hospitalist teams. Other changes included adding a dedicated ward teaching session, putting a strict time limit on rounds, and beginning to implement family-centered rounds with nursing. There were no differences in other resources or facilities (eg, computer systems, ancillary staff).

**Data Collection**

Standard residency evaluations submitted at the end of each clinical rotation were analyzed. The period before the restructuring was July 2007 through June 2008. A 4-month phase-in period for the new ward structure was allowed. Evaluations from November 2008 through October 2009 were analyzed for the period after the restructuring. These evaluations were completed in a Web-based evaluation and reporting system: E*Value (Advanced Informatics, LLC, Brooklyn Park, MN; http://www.advancedinformatics.com).
Rotation evaluations consisted of 1 item rating overall educational value (1 = poor, 5 = excellent) and 2 items describing environment and feedback (1 = strongly disagree, 5 = strongly agree). Resident evaluations of attending physicians consisted of 17 questions on teaching skills, support of autonomy, feedback, and workplace relationships (1 = strongly disagree, 5 = strongly agree). We included faculty evaluations for subspecialists and hospitalists who had at least 1 full month on service. Aggregate analysis protected the identity of residents and attending physicians.

Case mix index (CMI) and average length of stay (ALOS) were both calculated by using data on all patients discharged from the involved teams during the study periods. CMI was calculated by using methods defined by both Medicare and National Association of Children’s Hospitals and Related Institutions.

Statistical Analysis
Nonparametric Wilcoxon–Mann–Whitney rank-sum tests were used to characterize differences in mean responses from both the rotation and attending evaluations. Two-sided independent sample t tests were used to evaluate variations in CMI and ALOS. Significance was set at a 2-sided P value <.05.

The results from the resident evaluation of attending physicians were grouped in 2 ways to better clarify the impact of the change to hospitalist attending physicians as opposed to the other structural changes made. To clarify how skills might differ between types of attending physicians, we compared all attending physicians (primarily subspecialists) before the restructuring with all hospitalists after the restructuring. To help elucidate the impact of the overall structural change apart from the change in type of attending, we compared hospitalists from before the restructuring with hospitalists after the restructuring.

Qualitative Analysis
A thematic analysis of all the comments in the evaluations of the clinical rotations and of individual attending physicians was completed. One of the authors (Dr Lockspeiser) read through all qualitative data and identified initial codes. The data were independently analyzed by 2 other authors (Ms Stumpf and Dr Burgis) and, through subsequent discussions, the codes were grouped into emerging themes. Through an iterative process, consensus was reached among the coding researchers regarding the definition of the coding categories and themes, and their application to the data under consideration.

RESULTS
Before the restructuring (July 2007–June 2008) 139 (95%) of 147 ward rotation evaluations were completed by 62 different residents. In addition, 65 attending evaluations of 5 hospitalist attending physicians and 602 evaluations of 32 subspecialist attending physicians in 8 different subspecialties were completed. After the restructuring (November 2008–October 2009), 103 (75%) of 138 ward rotation evaluations were completed by 94 different residents. In addition, 188 attending evaluations of 8 hospitalist attending physicians were completed.

Patient Characteristics
Patient diagnoses and complexity remained stable before and after the restructuring. There were no significant changes before and after restructuring to ALOS (5.20 vs 5.23 days; P = .878) or CMI (Medicare–CMI: 0.99 vs 1.00 [P = .876]; National Association of Children’s Hospitals and Related Institutions–CMI: 1.15 vs 1.20 [P = .335]).

Ward Rotation Evaluations
After the restructuring, residents rated the overall educational value of the ward rotation significantly higher than the educational value of the traditional structure (before: 3.87; after: 4.25 [P = .002]). After the restructuring, residents agreed more strongly that attending physicians met with them at least once to give feedback on their overall performance (before: 2.90; after: 4.41 [P < .001]). Ratings regarding the instructional environment (consisting of the facilities, space, and equipment provided) did not change (before: 3.25; after: 3.5 [P = .063]).

Resident Evaluations of Attending Physicians
Despite resident perceptions before the restructuring, hospitalists were ranked significantly higher on their ability to balance house staff independence with supervision and to involve house staff in the decision-making process compared with subspecialists (4.21 vs 4.46 [P < .01] and 4.21 vs 4.60 [P < .001], respectively). After the restructuring, hospitalists were ranked significantly higher on their ability to balance house staff independence with supervision and to involve house staff in the decision-making process compared with all attending physicians before the restructuring (4.24 vs 4.65 [P < .001] and 4.25 vs 4.73 [P < .001], respectively) (Table 1). Comparing hospitalists before and after the restructuring, there were no differences in the 2 variables related to autonomy (ability to balance house staff independence with supervision and
to involve house staff in the decision-making process) (Table 2). There were several significant differences in other categories, including giving and accepting feedback, providing useful and stimulating teaching conferences, increased concern for house staff, and acting as a positive role model for dealing with other house staff, hospital personnel, and colleagues.

**Qualitative Evaluation: Themes From Before Restructuring**

**Lack of Autonomy**

There were fewer comments about autonomy before the restructuring, and these comments more often reflected resident frustration about lack of autonomy. Comments included limits on residents’ empowerment to lead the team or make independent clinical decisions. One resident stated, “Often the team was also left out of important decisions and was just paged to write the order.” Another resident remarked, “I don’t feel like she involves house staff enough in management decisions, often we are just ‘told’ what to do and don’t get to learn and participate in the decision making.”

**Didactic Teaching**

Before the restructuring, the majority of the comments related to the attending physicians’ teaching abilities in didactic settings, with references to formal teaching sessions, lectures, and chalk talks. For example, 1 resident commented, “I thoroughly enjoyed and learned a great deal from her lectures. I wished we had time for more of them.” There were also several comments that mentioned a particular teaching session such as, “Gave an excellent lecture on headaches.” After the restructuring, there were minimal comments about didactic teaching.

**Learning Through Hearing an Attending Explain Decision-making**

A prominent theme in the comments before the restructuring related to residents’ ability to learn by hearing the attending physicians explain their decisions.
decision-making rather than having residents involved in the decision-making themselves. One resident stated, “She verbalizes her thought processes, which is great for residents to hear and see how she is thinking.” Another commented, “He was patient about explaining treatment rationale to us, and was concerned with making sure we understood why we were doing things a certain way.” After the restructuring, this theme was overshadowed by residents’ own participation in clinical decision-making.

**Complexity of Patients**
The complexity of the patients was noted as a factor that limited residents’ autonomy. One resident commented, “From day one we were managing very complicated GI patients and not given any framework or background on the diseases that they had or the therapies used. Thus, it was nearly impossible to make independent decisions.” This same commentary was not evident in the new structure, even though the same range of specialty patients was present.

**Qualitative Evaluation: Themes After the Restructuring**

**Components of Autonomy: Leadership**
Team leadership, referring to the senior resident’s ability to teach, lead rounds, and supervise the interns and students, was noted as a strength after the restructuring. One resident remarked, “The strength in this rotation lies in the attending and how much involvement we are given as a ‘team leader.’ Every attending I worked with really allowed me to run rounds and be responsible for managing patients and this really made the rotation more enjoyable and beneficial to my learning.” Another resident stated, “Great at letting the senior resident run rounds and really feel like the head of the team.”

**Components of Autonomy: Decision-Making**
Clinical decision-making in which residents felt ownership for their patients...
and were able to independently define treatment plans was highlighted after the restructuring. One resident stated, “I appreciate how much he involves the house staff in clinical decisions, and forces us to think through why we are doing certain tests, treatments, etc.” Another resident said, “She pushes the residents and med students more than any attending I’ve worked with to come up with our own plans in a constructive, positive way.”

Appropriate Balance of Autonomy and Supervision

A key theme after the restructuring was that residents felt they could make independent decisions with the appropriate level of attending supervision and support. One resident commented: “He has an unparalleled ability to keep his knowledge under wraps until after a resident/med student has had the chance to formulate his or her own idea for what is going on. He was a stealth supportive force on the team who empowered senior residents to fill their role as leader on the team but provided knowledge in a gentle and non-overpowering way when more knowledge was clearly needed to give good patient care.” Another stated, “He allowed me, as the senior resident, to really feel like I was running rounds and managing patients, yet every time he spoke up, it was to offer incredibly insightful commentary (in a calm and respectful manner) that helped move care in the right direction.”

DISCUSSION

One year after a significant ward restructuring at UCSF Benioff Children’s Hospital, residents reported marked improvement in the overall educational value of this key clinical experience. Contrary to concerns raised by our residents and discussed in the literature,9,14-16 the greater attending presence provided by hospitalists did not diminish resident autonomy; indeed, under the new hospitalist-supervised system, residents’ perception of autonomy increased. Although the type and complexity of patients on the teams did not change, hospitalists were perceived as more successful than subspecialists at fostering resident independence and autonomy.

Themes from the qualitative analysis help provide a deeper understanding of how residents’ experiences differed before and after the restructuring. Although we did not separate the comments regarding the subspecialists from the comments regarding the hospitalists before the restructuring, the themes were mostly composed of comments about working with subspecialists. Overall, resident autonomy was the most pervasive theme throughout the qualitative data.

Qualitative themes from the evaluation narratives revealed that residents described how hospitalists taught on rounds, emphasizing clinical decision-making and critical analysis of problems rather than factual knowledge. In contrast, residents reported that subspecialists taught fundamentals and described why they made decisions during separate talks. The hospitalist approach seemed to correlate with a greater sense of independence among residents in both clinical decision-making and team leadership. In addition, the complexity of patients was no longer seen as a barrier to resident autonomy in teams lead by hospitalists even though the patient diagnoses and complexity (as measured by using ALOS and CMI) did not change. Our data support published findings that patient-centered teaching, encouragement of autonomy, and fostering of problem solving are all skills of exemplary pediatric hospitalist educators.17

Our results fit within the educational theory of situated learning at work, in which trainees learn through actual participation in work tasks. Legitimate peripheral participation allows learners to actively contribute to an expert’s work, with initially limited responsibility that is gradually increased as they advance, matching their responsibilities with their skills.18 In our study, the emphasis on the hospitalists’ ability to balance autonomy and independence suggests that hospitalists are able to engage the residents at the appropriate level, providing them with legitimate learning experiences. The residents learn best when they are challenged to be autonomous yet are provided with the hospitalists’ continued support and encouragement.

Although we highlighted the positive effects of exposure to hospitalists, there is also a downside. The concentration of resident time with hospitalists decreases teaching and mentoring of residents by subspecialists.19 Thus, future directions for our residency are largely focused on ensuring teaching by subspecialists and fostering career development and mentorship in the subspecialties.

Improvements in the resident experience stemmed not only from the influence of hospitalists but also from the structural changes that were made. Evidence for the positive impact of the structural changes separate from the switch to hospitalist attending physicians can be seen in the improvement in hospitalists’ scores on several...
attributes after the restructuring, even though the hospitalists themselves did not change. Changes in these attributes were not a primary focus of this study but could lead to additional research. Given the complexity of the reorganization, it is hard to calculate the precise contribution of each element to the improved resident learning experience. It seems clear that both the logistical improvements and the skill of hospitalists as attending physicians were important factors.

There are several potential limitations to our study. First, our results at a single site may not be generalizable to other settings. However, if almost one-half of pediatric residency training programs are planning to expand the use of hospitalists in clinical teaching, experiences from other models may optimize success. Furthermore, resident perceptions of their educational experience are only 1 measure of the educational impact of the restructuring. Our evaluation was completed 1 year after the restructuring to identify needs for further improvements in the new system. However, given the steep learning curve with any change and peri-interventional effects, recommendations have been made that several years pass before making final comparisons. The response rate to evaluations after the restructuring was lower than before, likely because not all residents complete evaluations immediately, yet are required to do so before graduation. The comments from the resident evaluations could not be probed with follow-up questions due to the nature of our study. Finally, we did not evaluate the impact of the attending’s gender, age, or teaching experience on resident evaluations, although at our institution there is no obvious dichotomy between the hospitalists and the subspecialists in any of these factors.

Our results suggest that by restructuring to hospitalist-led teams on a day–night schedule, residents perceive that autonomy can grow, leadership skills may be strengthened, and independent decision-making can be fostered. Additional research should be conducted to further elucidate specific teaching skills that foster resident autonomy. As more academic children’s hospitals adopt similar models, it is important to set educational priorities to support resident autonomy and foster learning opportunities.

REFERENCES