

Selected Articles on the Patient Hand-off
Compiled by Ingrid Philibert, Updated December 2007

Articles are arrayed by topic within the hand-off literature, beginning with the most recent citation

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Analyses of Critical Incidents Related to the Hand-off

Singh H, Thomas EJ, Petersen LA, Studdert DM. Medical errors involving trainees: a study of closed malpractice claims from 5 insurers. Arch Intern Med. 2007 Oct 22;167(19):2030-6.

Despite wide recognition that the delivery of medical care by trainees involves special risks, information about the types and causes of medical errors involving trainees is limited. To describe the characteristics of and factors contributing to trainee errors, the authors analyzed malpractice claims in which trainees were judged to have played an important role in harmful errors. The claims were closed between 1984 and 2004, and the errors occurred between 1979 and 2001. Specialist physicians reviewed random samples of closed malpractice claim files at 5 liability insurers from 2002 to 2004 and determined whether injuries had occurred, and if so, whether they were due to error. The authors described the clinical circumstances and contributing factors associated with harmful errors involving trainees ("cases"). The authors also compared the characteristics of cases with their nontrainee counterparts and probed trainee errors attributed to teamwork problems and lack of technical competence or knowledge.

Among 240 cases, errors in judgment (173 of 240 [72%]), teamwork breakdowns (167 of 240 [70%]), and lack of technical competence (139 of 240 [58%]) were the most prevalent contributing factors. Lack of supervision and handoff problems were most prevalent types of teamwork problems, and both were disproportionately more common among errors that involved trainees than those that did not (respectively, 54% vs 7% [P < .001] and 20% vs 12% [P = .009]). The most common task during which failures of technical competence occurred were diagnostic decision making and monitoring of the patient or situation. Trainee errors appeared more complex than nontrainee errors (mean of 3.8 contributing factors vs 2.5 [P < .001]). In addition to problems with handoffs, house staff are particularly vulnerable to medical errors owing to teamwork failures, especially lack of supervision. Graduate medical education reform should focus on strengthening these aspects of training.

Arora V, Johnson J, Lovinger D, Humphrey HJ, Meltzer DO. Communication failures in patient sign-out and suggestions for improvement: a critical incident analysis. Qual Saf Health Care. 2005 Dec;14(6):401-7.

The transfer of care for hospitalized patients between inpatient physicians is routinely mediated through written and verbal communication or "sign-out". This study aims to describe how communication failures during this process can lead to patient harm. In interviews employing critical incident technique, first year resident physicians (interns) described (1) any adverse events or near misses due to suboptimal preceding patient sign-out; (2) the worst event due to suboptimal sign-out in which they were involved; and (3) suggestions to improve sign-out. All data were analyzed and categorized using the constant comparative method with independent review by three researchers. Twenty six interns caring for 82 patients were interviewed after receiving sign-out from another intern. Twenty five discrete incidents, all the result of communication failures during the preceding patient sign-out, and 21 worst events were described. Inter-rater agreement for categorization was high (kappa 0.78-1.00). Omitted content (such as medications, active problems, pending tests) or failure-prone communication processes (such as lack of face-to-face discussion) emerged as major categories of failed communication. In nearly all cases these failures led to uncertainty during decisions on patient care. Uncertainty may result in inefficient or suboptimal care such as repeat or unnecessary tests. Interns desired thorough but relevant face-to-face verbal sign-outs that reviewed anticipated issues. They preferred legible, accurate, updated, written sign-out sheets that included standard patient content such as code status or active and anticipated medical problems. Communication failures during sign-out often lead to uncertainty in decisions on patient care. These may result in inefficient or suboptimal care leading to patient harm.

Solet DJ, Norvell JM, Rutan GH, Frankel RM. Lost in translation: challenges and opportunities in physician-to-physician communication during patient handoffs. Acad Med. 2005 Dec;80(12):1094-9.

Handoffs involve the transfer of rights, duties, and obligations from one person or team to another. In many high-precision, high-risk contexts such as a relay race or handling air traffic, handoff skills are practiced repetitively to optimize precision and anticipate errors. In medicine, wide variation exists in handoffs of hospitalized patients from one physician or team to another. Effective information transfer requires a solid foundation in communication skills. While these skills have received much attention in the medical literature, scholarship has focused on physician-to-patient, not physician-to-physician, communication. Little formal attention or education is available to reinforce this vital link in the continuity of patient care. The authors reviewed the literature on patient handoffs and evaluated the patient handoff process at Indiana University School of Medicine's internal medicine residency. House officers there rotate through four hospitals with three different computer systems. Two of the hospitals employ a computer-assisted patient handoff system; the other two utilize the standard pen-to-paper method. Considerable variation was observed in the quality and content of handoffs across these settings. Four major barriers to effective handoffs were identified: (1) the physical setting, (2) the social setting, (3) language barriers, and 4) communication barriers. The authors conclude that irrespective of local context, precise, unambiguous, face-to-face communication is the best way to ensure effective handoffs of hospitalized patients. They also maintain that the handoff process must be standardized and that students and residents must be taught the most effective, safe, satisfying, and efficient ways to perform handoffs.

Chassin MR, Becher EC. The wrong patient. Ann Intern Med. 2002 Jun 4;136(11):826-33.

Among all types of medical errors, cases in which the wrong patient undergoes an invasive procedure are sufficiently distressing to warrant special attention. Nevertheless, institutions underreport such procedures, and the medical literature contains no discussions about them. This article examines the case of a patient who was mistakenly taken for another patient's invasive electrophysiology procedure. After reviewing the case and the results of the institution's "root-

cause analysis," the discussants discovered at least 17 distinct errors, no single one of which could have caused this adverse event by itself. The discussants illustrate how these specific "active" errors interacted with a few underlying "latent conditions" (system weaknesses) to cause harm. The most remediable of these were absent or misused protocols for patient identification and informed consent, systematically faulty exchange of information among caregivers, and poorly functioning teams.

Petersen LA, Brennan TA, O'Neil AC, Cook EF, Lee TH. Does housestaff discontinuity of care increase the risk for preventable adverse events? *Ann Intern Med.* 1994 Dec 1;121(11):866-72.

To study the relation between housestaff coverage schedules and the occurrence of preventable adverse events, this case-control study was conducted in an urban teaching hospital. All 3146 patients admitted to the medical service during a 4-month period were included. The measurements were a previously tested confidential self-report system to identify adverse events, which were defined as unexpected complications of medical therapy that resulted in increased length of stay or disability at discharge. A panel of three board-certified internists confirmed events and evaluated preventability based on case summaries. Housestaff coverage was coded according to the day in the usual intern's schedule and to cross-coverage status. Cross-coverage was defined as care by a house officer who was not the patient's usual intern and not a member of the usual intern's patient care team. Coverage for an adverse event was assigned according to who was covering during the proximate cause of that event. Clinical data were collected for each patient and two matched controls. Of the 124 adverse events reported and confirmed, 54 (44%) were judged potentially preventable. In the univariate analysis, patients with potentially preventable adverse events were more likely than their controls to be covered by a physician from another team at the time of the event (26% compared with 12% [odds ratio, 3.5; $P = 0.01$]). In the multivariate analysis, three factors were significant independent correlates of potentially preventable adverse events; cross-coverage (odds ratio, 6.1; 95% CI, 1.4 to 26.7), Acute Physiology and Chronic Health Evaluation II score (odds ratio per point, 1.2; CI, 1.1 to 1.4), and history of gastrointestinal bleeding (odds ratio, 4.7; CI, 1.2 to 19.0). Potentially preventable adverse events were strongly associated with coverage by a physician from another team, which may reflect management by housestaff unfamiliar with the patient. The results emphasize the need for careful attention to the outcome of work-hour reforms for housestaff.

Lofgren RP, Gottlieb D, Williams RA, Rich EC. Post-call transfer of resident responsibility: its effect on patient care. *J Gen Intern Med.* 1990 Nov-Dec;5(6):501-5.

The objective was to determine whether transferring the care of patients to another senior resident the day after admission to the hospital adversely affects the efficiency and quality of care. The design was a retrospective analysis of a natural experiment set in the general medical service of the Minneapolis Veterans Affairs Medical Center, a major tertiary teaching hospital of the University of Minnesota internal medicine residency program. Subjects were all the patients admitted to the medicine service from 5:00 PM to 6:00 AM over an eight-month period. After 5:00 PM, half of the patients were admitted to the hospital by a cross-covering senior resident (CC group of patients), and their care was transferred to a different senior resident the following day. The other patients were initially evaluated by the primary senior resident (PE group of patients). Assignment to the different services was a random, sequential process. The CC group had significantly more laboratory tests performed during their hospital stay than did the PE group of patients (44 vs. 32, $p = 0.01$), even when adjusted for length of stay. Using multiple linear regression to adjust for other clinical parameters including length of stay, DRG weight, and number of consults, the authors found that being a CC subject was a significant predictor of the number of laboratory tests obtained ($p = 0.01$). Furthermore, the median length of stay in the CC group ($n = 74$) was longer than that in the PE group ($n = 72$) (eight days vs. six days); this was of borderline statistical significance, using a two-sample median test ($p = 0.06$). Patients transferred to a different resident the day after admission had more laboratory tests performed and longer inpatient stays.

Cooper JB, Long CD, Newbower RS, Philip JH. Critical incidents associated with intraoperative exchanges of anesthesia personnel. *Anesthesiology*. 1982 Jun;56(6):456-61.

It is a common practice for anesthesia to substitute for one another, especially for short breaks during long surgical procedures. The assets and liabilities of this practice of relief have not been examined previously. In the course of gathering 1,089 reports of preventable errors and failures associated with anesthesia management, the authors identified 96 which involved a relief anesthetist. This subset was examined in search of common characteristics and patterns of cause and discovery of errors. In 28 incidents, the relief anesthetist discovered an error or the cause of an error. In 10 incidents, the process of relief was identified as having contributed to the commission of an error. Although 70 of the 1,089 incidents were associated with substantive negative outcomes, e.g., death, cardiac arrest, or extended ICU stay, none of those incidents was caused by a relieving anesthetist. There is a strong implication that relief is beneficial more often than not even aside from the presumed beneficial effect on the vigilance of the primary anesthetist (the latter effect was outside the scope of this study). From the descriptions of the causes and discoveries of errors in these relief-related incidents, guidance can be drawn for the safe and effective conduct of the intraoperative exchange of anesthesia personnel.

Editorials

McKeon LM, Oswaks JD, Cunningham PD. Safeguarding patients: complexity science, high reliability organizations, and implications for team training in healthcare. *Clin Nurse Spec*. 2006 Nov-Dec;20(6):298-304; quiz 305-6.

Serious events within healthcare occur daily exposing the failure of the system to safeguard patient and providers. The complex nature of healthcare contributes to myriad ambiguities affecting quality nursing care and patient outcomes. Leaders in healthcare organizations are looking outside the industry for ways to improve care because of the slow rates of improvement in patient safety and insufficient application of evidenced-based research in practice. Military and aviation industry strategies are recognized by clinicians in high-risk care settings such as the operating room, emergency departments, and intensive care units as having great potential to create safe and effective systems of care. Complexity science forms the basis for high reliability teams to recognize even the most minor variances in expected outcomes and take strong action to prevent serious error from occurring. Cultural and system barriers to achieving high reliability performance within healthcare and implications for team training are discussed.

Singer JI, Dean J. Emergency physician intershift handovers: an analysis of our transitional care. *Pediatr Emerg Care*. 2006 Oct;22(10):751-4.

The emergency department intershift transfer of patient care is a universal event. Despite the frequency of its occurrence and complexity of issues surrounding the exchange, emergency department patient handover is insufficiently explored in the literature. This article reviews the effectiveness and efficiencies of the handover practice. The authors provide personal opinion regarding favorable parameters for the prehandover, intershift meeting, and posthandover activities.

Philibert I, Leach DC. Re-framing continuity of care for this century. *Qual Saf Health Care*. 2005 Dec;14(6):394-6.

It is widely accepted that “continuity of care” is vital to its quality and safety. The traditional approach in achieve it in the inpatient setting has been to minimize transfers among providers to reduce interruptions in the care process. In recent years, the effort to limit duty hours for resident physicians (junior doctors) in the US, UK, and EU has highlighted that continuity of care in teaching hospitals cannot depend on trainees working beyond limits that are advisable from a performance and safety perspective. Changing practice in teaching settings and a general movement toward shift- and team-based approaches to patient care have thrust into prominence

the patient "hand-off" (also referred to as "hand-over," "sign-out," or "sign-over") as the process that enables multiple physicians to collectively ensure continuity and currency of information and care. Hand-offs are present at many places in the care process. In teaching hospitals, their frequency has increased since the imposition of limits on resident (junior doctor) hours, in large part due to the use of duty shifts, and "short-call" and "cross-coverage" models, in which responsibility for patients is transferred several times during the traditional 24-hour call period. Duty hour limits also appear to affect the hand-off in other ways, such as reducing the time available for this critical aspect of care.

Education to Improve the Hand-Off

Horwitz LI, Moin T, Green ML. Development and implementation of an oral sign-out skills curriculum. J Gen Intern Med. 2007 Oct;22(10):1470-4.

Imperfect sign-out of patient information between providers has been shown to contribute to medical error, but there are no standardized curricula to teach sign-out skills. At their institution, the authors identified several deficiencies in skills and a lack of any existing training. The aim was to develop a sign-out curriculum for medical house staff. In an internal medicine residency program, the authors developed a 1-h curriculum and implemented it in August of 2006 at three hospital sites. Teaching strategies included facilitated discussion, modeling, and observed individual practice with feedback. This emphasized interactive communication, a structured sign-out format summarized by an easy-to-remember mnemonic ("SIGNOUT"), consistent inclusion of key content items such as anticipatory guidance, and use of concrete language. The authors received 34 evaluations. The mean score for the course was 4.44 +/- 0.61 on a 1-5 scale. Perceived usefulness of the structured oral communication format was 4.46 +/- 0.78. Participants rated their comfort with providing oral sign-out significantly higher after the session than before (3.27 +/- 1.0 before vs. 3.94 +/- 0.90 after; $p < .001$). The authors developed an oral sign-out curriculum that was brief, structured, and well received by participants. Further study is necessary to determine the long-term impact of the curriculum.

Committee on Patient Safety and Quality Improvement. ACOG committee opinion. Number 367. June 2007. Communication strategies for patient handoffs. Obstet Gynecol. 2007 Jun;109(6):1503-5.

Handoff communication, which includes up-to-date information regarding patient care, treatment and service, condition, and any recent or anticipated changes, should be interactive to allow for discussion between the giver and receiver of patient information. It requires a process for verification of the received information, including read-back or other methods as appropriate.

Catchpole KR, de Leval MR, McEwan A, Pigott N, Elliott MJ, McQuillan A, MacDonald C, Goldman AJ. Patient handover from surgery to intensive care: using Formula 1 pit-stop and aviation models to improve safety and quality. Paediatr Anaesth. 2007 May;17(5):470-8.

The authors aimed to improve the quality and safety of handover of patients from surgery to intensive care using the analogy of a Formula 1 pit stop and expertise from aviation. A prospective intervention study measured the change in performance before and after the implementation of a new handover protocol that was developed through detailed discussions with a Formula 1 racing team and aviation training captains. Fifty (23 before and 27 after) postsurgery patient handovers were observed. Technical errors and information omissions were measured using checklists, and teamwork was scored using a Likert scale. Duration of the handover was also measured. The mean number of technical errors was reduced from 5.42 (95% CI +/-1.24) to 3.15 (95% CI +/-0.71), the mean number of information handover omissions was reduced from 2.09 (95% CI +/-1.14) to 1.07 (95% CI +/-0.55), and duration of handover was reduced from 10.8 min (95% CI +/-1.6) to 9.4 min (95% CI +/-1.29). Nine out of twenty-three (39%) precondition patients had more than one error in both technical and information handover prior to the new

protocol, compared with three out of twenty-seven (11.5%) with the new handover. Regression analysis showed that the number of technical errors were significantly reduced with the new handover ($t = -3.63$, $P < 0.001$), and an interaction suggested that teamwork ($t = 3.04$, $P = 0.004$) had a different effect with the new handover protocol. The introduction of the new handover protocol lead to improvements in all aspects of the handover. Expertise from other industries can be extrapolated to improve patient safety, and in particular, areas of medicine involving the handover of patients or information.

Broekhuis M, Veldkamp C. The usefulness and feasibility of a reflexivity method to improve clinical handover. J Eval Clin Pract. 2007 Feb;13(1):109-15.

This is the evaluation of the usefulness and feasibility of the reflexivity method (RM), which encourages dialogue and reflections between doctors, and enables change. On the basis of literature research into effective medical professional learning and reflection, essential elements that stimulate reflection and learning were distinguished and converted into the basic elements of a method developed for this purpose, the RM. The method is used as a tool to stimulate reflection processes, which, in turn, will enable change. It was used 20 times in a large university medical centre in the Netherlands. Clinical handovers were the subject of reflection. The evaluation of the usefulness and feasibility of the RM is based on analyzing the improvements realized by using the method, and a questionnaire to measure the experiences of the users of the method.

Each of the 17 departments evaluated received 10 recommendations on average. Fifty-eight per cent of these were realized after 6-9 months, and 18% were in the working-out phase. Improvements in the structure, rules and protocols concerning handovers were realized as well as in the atmosphere. The users of the method evaluated the method overall positively: they appreciated the created context for reflection, that is, having a dialogue with a colleague working at the same hierarchical level, the non-normative character of the method and the 'doctor-ownership' of the method. They also reported an effect on their handling and thinking regarding handovers. The RM seems to be a useful and feasible method to stimulate the doctors' reflection processes, resulting in implemented improvements.

Arora V, Johnson J. A model for building a standardized hand-off protocol. Jt Comm J Qual Patient Saf. 2006 Nov;32(11):646-55.

The Joint Commission has made a "standardized approach to hand-off communications" a National Patient Safety Goal. An interactive 90-minute workshop (hand-off clinic) was developed in 2005 to (1) develop a standardized process for the handoff, (2) create a checklist of critical patient content, and (3) plan for dissemination and training. To date, 7 of 10 residency programs have participated. Analysis of these protocols demonstrated that the hand-off process is highly variable and discipline-specific. Although all disciplines required a verbal handoff, because of competing demands, verbal communication did not always occur. In some cases, the transfer of professional responsibility was separated in time and space from the transfer of information. For example, in two cases, patient tasks were assigned to other team members to facilitate timely departure of a postcall resident (to meet resident duty-hour restrictions), but results were not formally communicated to anyone. The hand-off clinic facilitated the incorporation of "closed-loop" communication by requiring that follow-up on these tasks be conveyed to the on-call resident. This model for design and implementation can be applied to other health care settings.

Alvarado K, Lee R, Christoffersen E, Fram N, Boblin S, Poole N, Lucas J, Forsyth S. Transfer of accountability: transforming shift handover to enhance patient safety. Healthc Q. 2006 Oct;9 Spec No:75-9.

Communication of information between healthcare providers is a fundamental component of patient care. The information shared between providers who are changing shifts, referred to as "handover," helps plan patient care, identifies safety concerns and facilitates continuity of information. Absent or inaccurate information can have deleterious effects on patient care. According to the Joint Commission on Accreditation of Healthcare Organizations (JCAHO

2003), almost 70% of all sentinel events are caused by breakdown in communication. Issues and concerns regarding the effectiveness of handover at shift change were raised by nurses throughout Hamilton Health Sciences (HHS), leading to the approval of a hospital-wide project to implement evidenced-based Transfer of Accountability (TOA) Guidelines and a bedside patient safety checklist. This article describes the development of the guidelines, the results of the pilot study and the ongoing implementation of the project. The observed impact on patient safety within HHS is presented.

Fang L, Ming Y, Yu WC. A project to improve the completeness of nursing shift reports in the surgical ward [Article in Chinese]. Hu Li Za Zhi. 2006 Jun;53(3):52-9.

The authors found that surgical ward shift reports were not being adequately completed, with 29.4% of content items on shift reports not reaching 80% completeness. After an analysis of the situation, the authors found that the problems were caused by factors that included lack of understanding of shift report contents, inappropriate shift reporting standards, lack of specialty-related knowledge and guidance in the shift report, and discontinuities in patient care allocation. Based on these findings, the researchers revised shift-reporting standards, redesigned the report format, conducted relevant training, and changed the shift assignment methodology. A survey conducted following implementation of researcher-directed changes found that 100% shift report items had reached 80% completeness and achieved improvement goals. At the same time, the author found full staff participation and lack of confidence to be, respectively, the principal strength and weakness in accomplishing this project. A limitation of this project is that it cannot be applied to non-surgical wards. Project methods have already been applied to new staff training in the hospital at which this study was conducted. Based on project findings and experience, the author also makes the following additional suggestions: (1) shift report-related content, skills and principles should be incorporated into school curricula; (2) shift report should be monitored and updated regularly; and (3) follow-on research may explore the factors that affect shift report content completeness.

Haig KM, Sutton S, Whittington J. SBAR: a shared mental model for improving communication between clinicians. Jt Comm J Qual Patient Saf. 2006 Mar;32(3):167-75.

The importance of sharing a common mental model in communication prompted efforts to spread the use of the SBAR (Situation, Background, Assessment, and Recommendation) tool at OSF St. Joseph Medical Center, Bloomington, Illinois. CASE An elderly patient was on warfarin sodium (Coumadin) 2.5 mg daily. The nurse received a call from the lab regarding an elevated international normalized ratio (INR) but did not write down the results (she was providing care to another patient). On the basis of the previous lab cumulative summary, the physician increased the warfarin dose for the patient; a dangerously high INR resulted. The medical center initiated a collaborative to implement the use of the SBAR communication tool. Education was incorporated into team resource management training and general orientation. Tools included SBAR pocket cards for clinicians and laminated SBAR "cheat sheets" posted at each phone. SBAR became the communication methodology from leadership to the microsystem in all forms of reporting. Staff adapted quickly to the use of SBAR, although hesitancy was noted in providing the recommendation" to physicians. Medical staff were encouraged to listen for the SBAR components and encourage staff to share their recommendation if not initially provided.

Leonard M, Graham S, Bonacum D. The human factor: the critical importance of effective teamwork and communication in providing safe care. Qual Saf Health Care. 2004 Oct;13 Suppl 1:i85-90.

Effective communication and teamwork is essential for the delivery of high quality, safe patient care. Communication failures are an extremely common cause of inadvertent patient harm. The complexity of medical care, coupled with the inherent limitations of human performance, make it critically important that clinicians have standardized communication tools, create an environment in which individuals can speak up and express concerns, and share common "critical language" to alert team members to unsafe situations. All too frequently, effective communication is situation

or personality dependent. Other high reliability domains, such as commercial aviation, have shown that the adoption of standardized tools and behaviors is a very effective strategy in enhancing teamwork and reducing risk. The authors describe the ongoing patient safety implementation using this approach within Kaiser Permanente, a non-profit American healthcare system providing care for 8.3 million patients. The authors describe specific clinical experience in the application of surgical briefings, properties of high reliability perinatal care, the value of critical event training and simulation, and benefits of a standardized communication process in the care of patients transferred from hospitals to skilled nursing facilities. Additionally, lessons learned as to effective techniques in achieving cultural change, evidence of improving the quality of the work environment, practice transfer strategies, critical success factors, and the evolving methods of demonstrating the benefit of such work are described.

Ethnomethod Studies or Studies Clarifying Process and Taxonomy

Kellogg KC, Breen E, Ferzoco SJ, Zinner MJ, Ashley SW. Resistance to change in surgical residency: an ethnographic study of work hours reform. J Am Coll Surg. 2006 Apr;202(4):630-6.

Although the practical challenges to work hour restrictions have been the focus of much discussion, cultural resistance to such change has received less attention. Surgical residency has its own unique social structure, and the authors hypothesized that challenges to this would provide impediments to successful implementation of duty hours reform. The authors used ethnographic research methods to study the efforts at work hour restriction over a 15-month period before the introduction of the Accreditation Council for Graduate Medical Education regulations. These methods, validated for studying institutional change, build on intense periods of observation. Records of observations are then analyzed and coded to uncover cultural and political challenges. The frequency of successful hand-offs in sign-out situations between day and night float residents was measured as an objective index of success.

Practical issues were addressed initially by scheduling adjustments including creating a night float system. The hand-offs that this system required, however, were successful only 14% of the time. Subsequent steps to address the challenge to resident identity by top-down support of a new definition of professionalism increased the number of successful hand-offs to 39%. Finally, a reduction in a noted hierarchy violation led to successful hand-offs 79% of the time. These results demonstrate that practical solutions alone may not be a sufficient basis for change in surgical residency. While programs face other challenges to the traditional surgical culture, attention to social and political issues may enhance the success of these efforts.

Kowalsky J, Nemeth CP, Brandwijk M, et al. Understanding sign outs: conversation analysis reveals ICU handoff content and form. Critical Care Medicine. 2004. 32 (12): A29.

Transitions between shifts in the intensive care unit (ICU) create potential gaps in the continuity of care. Clinicians manage transitions using verbal hand-offs, or sign outs, to coordinate clinical work, authority, and responsibility. The complexity of medical interventions and rapid changes in patient condition make effective sign outs both essential and difficult. This study analyzed sign outs to improve both clinician ability to perform them and the continuity of patient care. The authors performed conversation analysis on audio recordings of twelve ICU handoffs. The authors initially hypothesized that the greatest amount of attention (expressed in the length of time care providers spent discussing an individual's condition) would be paid to patients who required the greatest amount of care (those who were ventilator-dependent, required cardiac care, or required multiple intravenous medications). However, correlations between discussion time and care demand were not significant. Instead, further content analysis indicated that uncertainty about patient condition influences handoff content and form. Sign outs are primarily used to account for what is known and not known about a patient's condition, and how both are likely to play out through the oncoming shift. Clinicians use two forms of conversation to conduct this

exchange: variations of soliloquy (monologue) and colloquy (dialogue). Both forms demonstrate the same variable, emotion laden, dynamic, and complex traits as the work domain that they are used to manage. Hand-offs are complex and flexible in their structure, focus on what is uncertain, are necessarily variable in their content, and take multiple forms. This is because patient progress is not a direct course of improvement, is complex, and is unpredictable. Findings from this study and further analyses can be used to develop clinician training in the conduct of sign outs, which promises to benefit both care providers and patients alike.

Patterson ES, Roth EM, Woods DD, Chow R, Gomes JO. Handoff strategies in settings with high consequences for failure: lessons for health care operations. *Int J Qual Health Care.* 2004 Apr;16(2):125-32.

The objective was to describe strategies employed during handoffs in four settings with high consequences for failure. This was designed as an analysis of observational data for evidence of use of 21 handoff strategies, set at NASA Johnson Space Center in Texas, nuclear power generation plants in Canada, a railroad dispatch center in the United States, and an ambulance dispatch center in Toronto. The main measure was evidence of 21 handoff strategies from observations and interviews. Nineteen of 21 strategies were used in at least one domain, on at least an 'as needed' basis. An understanding of how handoffs are conducted in settings with high consequences for failure can jumpstart endeavors to modify handoffs to improve patient safety.

Kerr MP. A qualitative study of shift handover practice and function from a socio-technical perspective. *J Adv Nurs.* 2002 Jan;37(2):125-34.

This was a qualitative study of shift handover practice and function from a socio-technical perspective. Background. Shift handover plays a pivotal role in the continuity of patient care in 24-hour nursing contexts. The critical nature of this communication system is recognized within the literature and by the nursing profession; however, there are few in-depth studies. The rationale for this study is to gain a better understanding of handover practices and functions and their implications for effectiveness. Handover systems on two very different pediatric wards were selected as case studies. In each case, 20 handovers were observed and audio-taped and 12 individual and two-group interviews with nursing staff about handover were also conducted. Analysis involved categorizing the data and characterizing handover practices and functions using an inductive approach to generate qualitative themes. The ethics committees of the hospital and the university approved the research. All involved were fully informed about the study, with confidentiality maintained throughout. Handover practices are distributed over time, socially among the staff and technologically through a range of artifacts, while the system also accomplishes informational, social and educational functions. Handover effectiveness is characterized by flexibility in managing competing demands and tensions, such as maintaining confidentiality while practicing family centered care. There are limitations in how far the findings can be generalized to other nursing contexts, and the possible effects of the researcher's presence are also recognized. Handover is a complex system based on several sound socio-technical principles and the value of this nurse-to-nurse communication should be acknowledged. The multiple functions highlight the knowledge and expertise currently hidden within handover, which could be promoted in terms of nursing professionalism.

Coiera EW, Jayasuriya RA, Hardy J, Bannan A, Thorpe ME. Communication loads on clinical staff in the emergency department. *Med J Aust.* 2002 May 6;176(9):415-8.

This was an observational study, set in two emergency departments, one rural and one urban, in New South Wales hospitals, between June and July 1999. Twelve clinical staff members participated, comprising six nurses and six doctors. The main outcome measures were time involved in communication; number of communication events, interruptions, and overlapping communications; choice of communication channel; purpose of communication. 35 hours and 13 minutes were observed, and 1286 distinct communication events were identified, representing 36.5 events per person per hour (95% CI, 34.5-38.5). A third of communication events (30.6%) were classified as interruptions, giving a rate of 11.15 interruptions per hour for all subjects; 10%

of communication time involved two or more concurrent conversations; and 12.7% of all events involved formal information sources such as patients' medical records. Face-to-face conversation accounted for 82%. While medical staff asked for information slightly less frequently than nursing staff (25.4% v 30.9%), they received information much less frequently (6.6% v 16.2%). The results support the need for communication training in emergency departments and other similar workplaces. The combination of interruptions and multiple concurrent tasks may produce clinical errors by disrupting memory processes. About 90% of the information transactions observed involved interpersonal exchanges rather than interaction with formal information sources. This may put a low upper limit on the potential for improving information processes by introducing electronic medical records.

O'Connell B, Penney W. Challenging the handover ritual. Recommendations for research and practice. Collegian. 2001 Jul;8(3):14-8.

Communicating nursing care during the patient's total hospital stay is a difficult task to achieve within the context of high patient turnover, a lack of overlap time between shifts, and time constraints. Clear and accurate communication is pivotal to delivering high quality care and should be the gold standard in any clinical setting. Handover is a commonly used communication medium that requires review and critique. This study was conducted in five acute care settings at a major teaching hospital. Using a grounded theory approach, it explored the use of three types of handover techniques (verbal in the office, tape-recorded, and bedside handovers). Data were obtained from semistructured interviews with nurses and participant field observations. Textual data were managed using NUD*IST. Transcripts were critically reviewed and major themes identified from the three types of handovers that illustrated their strengths and weaknesses. The findings of this study revealed that handover is more than just a forum for communicating patient care. It is also used as a place where nurses can debrief, clarify information and update knowledge. Overall, each type of handover had particular strengths and limitations; however, no one type of handover was appraised as being more effective. Achieving the multiple goals of handover presents researchers and clinicians with a challenging task. It is necessary to explore more creative ways of conducting the handover of patient care, so that an important aspect of nursing practice does not get classified as just another ritual.

Jones PE, Roelofsma PH. The potential for social contextual and group biases in team decision-making: biases, conditions and psychological mechanisms. Ergonomics. 2000 Aug;43(8):1129-52.

This paper provides a critical review of social contextual and group biases that are relevant to team decision-making in command and control situations. Motivated by the insufficient level of attention this area has received, the purpose of the paper is to provide an insight into the potential that these types of biases have to affect the decision-making of such teams. The biases considered are: false consensus, groupthink, group polarization and group escalation of commitment. For each bias the following four questions are addressed. What is the descriptive nature of the bias? What factors induce the bias? What psychological mechanisms underlie the bias? What is the relevance of the bias to command and control teams? The analysis suggests that these biases have a strong potential to affect team decisions. Consistent with the nature of team decision-making in command and control situations, all of the biases considered tend to be associated with those decisions that are important or novel and are promoted by time pressure and high levels of uncertainty. A concept unifying these biases is that of the shared mental model, but whereas false consensus emanates from social projection tendencies, the rest emanate from social influence factors. The authors also discuss the 'tricky' distinction between teams and groups and propose a revised definition for command and control team. Finally, the authors emphasize the need for future empirical research in this area to pay additional attention to the social side of cognition and the potential that social biases have to affect team decision-making.

Coiera E, Tombs V. Communication behaviors in a hospital setting: an observational study. BMJ. 1998 Feb 28;316(7132):673-6.

This was an exploratory study to identify patterns of communication behavior among hospital based healthcare workers. It was a non-participatory, qualitative observational study that took place in a British district general hospital. Eight doctors and two nurses were subjects. Communication behaviors resulted in an interruptive workplace, which seemed to contribute to inefficiency in work practice. Medical staff generated twice as many interruptions via telephone and paging systems as they received. Hypothesized causes for this level of interruption include a bias by staff to interruptive communication methods, a tendency to seek information from colleagues in preference to printed materials, and poor provision of information in support of contacting individuals in specific roles. Staff were observed to infer the intention of messages based on insufficient information, and clinical teams demonstrated complex communication patterns, which could lead to inefficiency. The results suggest a number of improvements to processes or technologies. Staff may need instruction in appropriate use of communication facilities. Further, excessive emphasis on information technology may be misguided since much may be gained by supporting information exchange through communication technology. Voicemail and email with acknowledgment, mobile communication, improved support for role based contact, and message screening may be beneficial in the hospital environment.

Strange F. Handover: an ethnographic study of ritual in nursing practice. Intensive Crit Care Nurs. 1996 Apr;12(2):106-12.

Three times every day in most of the hospitals and nursing homes in the UK, the so-called ritual of handover takes place. This ethnographic study examines that practice. The handovers of one ward were observed to see if they warrant the label of ritual as described by Helman (1990). Further analysis was performed to examine the functions and meanings of this practice. The conclusion from the analysis is that this practice does merit the label of ritual. Ritual is examined in terms of its meaning and found to serve valuable psychological, social and protective functions for its unwitting participants. Ritual serves another function, it plays an important role in valuing and emphasizing what comes to constitute working nursing knowledge. In conclusion, ritual should not be dismissed by a profession which claims a holistic approach as its espoused theory, but further investigated and utilized as a means for accessing nursing knowledge.

Gersick CJ, Hackman JR. Habitual routines in task-performing groups. Organ Behav Hum Decis Process. 1990;47:65-97.

Groups, like individuals, often develop habitual routines for dealing with frequently encountered stimuli. Although such routines are consequential for group life and work, little is known about them. This paper reconnoiters the territory of habitual behavior in groups that perform work within organizations. The authors offer a definition of group habits, identify their functions and dysfunctions, suggest how they develop and are maintained, and identify the circumstances when they are likely to be altered or abandoned. Throughout, the article gives special attention to the social nature of habitual routines in groups, to the interaction between habitual behavior and group life cycle phenomena, and to the role of the organizational context in prompting, shaping, and terminating habitual routines.

Increasing the Safety and Effectiveness of the Hand-off (Information Technology and Other Approaches to Enhance Communication and Documentation)

Wong MC, Turner P, Yee KC. Socio-cultural issues and patient safety: a case study into the development of an electronic support tool for clinical handover. Stud Health Technol Inform. 2007;130:279-89.

This paper describes a case study into the development of an electronic support tool for clinical handover conducted in the Royal Hobart Hospital's Department of General Internal Medicine. By directly involving clinicians as co-participants in the development, and by conceptualizing the system to be built as a support tool rather than as a 'total solution' this case study outlines the practical experience of dealing with a diversity of user requirements. The approach involved in-

depth fieldwork to understand the factors and their inter-relationships in clinical handover processes. From an analysis of the data generated key issues relating to work processes and potential impacts on patient safety were identified and discussed with clinicians. A support tool incorporating a series of design features aimed at improving patient safety and supporting existing work processes identified as important by the clinicians was developed. Through early and continual involvement of clinicians in the project, this case study highlights how socio-cultural analysis can be translated meaningfully (in terms of the end-users) into systems design. The paper aims to contribute to a stronger recognition within the domain of eHealth of user-centered approach to systems development for patient safety.

Bhabra G, Mackeith S, Monteiro P, Pothier DD. An experimental comparison of handover methods. Ann R Coll Surg Engl. 2007 Apr;89(3):298-300.

With the increase in shift pattern work for junior doctors in the NHS, accurate handover of patient clinical information is of great importance. There is no published method that forms the gold standard of handover and there are large variations in practice. This study aims to compare the reliability of three different handover methods. The authors observed the handover of 12 simulated patients over five consecutive handover cycles between SHOs on a one-to-one basis. Three handover styles were used and a numerical scoring system assessed clinical information lost per handover cycle. After five handover cycles, only 2.5% of patient information was retained using the verbal-only handover method, 85.5% was retained when using the verbal with note taking method and 99% was retained when a printed handout containing all patient information was used. When patient information is handed over by the verbal only method, very few facts are retained; therefore, this method should be avoided whenever possible. Verbal handover with note taking is shown to be an effective method of handover in this study, although the authors accept that this is an artificial scenario and may not reflect the reality of a busy hospital. Nearly all information is retained by the printed handout method but this relies on the handout being regularly updated.

Fenton W. Developing a guide to improve the quality of nurses' handover. Nurs Older People. 2006 Dec;18(11):32-6; quiz 37.

This article considers the importance of handover as a means of communicating important patient information from one nursing shift to the next. It describes the development of a guide, based on Essence of Care benchmarks, intended to improve the quality of nursing handover. A post implementation audit suggests that once staff were familiar with the guide, handovers became more structured and informative.

Keenan G, Yakel E, Marriott D. HANDS: A revitalized technology supported care planning method to improve nursing handoffs. Stud Health Technol Inform. 2006;122:580-4.

Care plans are required by the Joint Commission on Accreditation of Healthcare Organizations. Each day nurses create and file these plans in medical records. However, current forms of care plans do little to either enhance the flow of information or communicate shared patient goals. This paper introduces the theoretical model underpinning the HANDS care planning method and presents findings on the first year of a 3-year multisite study in which this method and a new Health Information Technology (HIT) application supporting the process were introduced. The theoretical model is derived from research on high reliability organizations and encompasses collective mind, mindfulness, and heedful interrelating. It focuses on the handoff as a focal point for not only information transfer but also reinforcing shared meaning and goals. The specific application, HANDS, integrates the NANDA, NIC, and NOC terminologies as a means of ensuring shared meaning across shifts and units. Early findings show the method has the potential of revolutionizing nursing practice.

Dahl Y. 'You have a message here': enhancing interpersonal communication in a hospital ward with location-based virtual notes. Methods Inf Med. 2006;45(6):602-9.

This paper aims to explore how computerized interpersonal information can be mediated through the physical environment of hospital wards. Specifically, it focuses on a communication service (location-based virtual notes) that allows hospital workers to leave short digital messages at relevant physical locations (e.g. by a patient bed), so that intended colleagues can pick them up later when entering such a location. In a work setting where personnel move between various locations mainly as a result of work priority, improving timeliness of information and reducing the number of work interruptions is essential. The authors' objective is to provide a set of user-motivated design guidelines that address important usability aspects of the proposed communication service. To get end user feedback, a prototype was built and tested in simulated scenarios with real hospital workers. The material gathered from the usability testing and following interviews was reviewed to identify critical usability issues. The authors identified a number of relevant usability issues concerning the applied design metaphor, posting of digital messages, role-based contact, and user control. These issues formed the basis for a set of preliminary design principles. The authors view the preliminary usability guidelines as an incentive for more extensive research. Based on feedback from the test participants, the authors conclude that the location-based virtual notes have promising potential to improve timeliness of ad hoc information exchange between hospital workers.

Solet DJ, Norvell JM, Rutan GH, Frankel RM. Lost in translation: challenges and opportunities in physician-to-physician communication during patient handoffs. Acad Med. 2005 Dec;80(12):1094-9.

See abstract on page 2.

Cheah LP, Amott DH, Pollard J, Watters DA. Electronic medical handover: towards safer medical care. Med J Aust. 2005 Oct 3;183(7):369-72.

As the working hours of junior doctors decrease, adequate handover of patients becomes more important to maintain continuity of care and avoid errors caused by information gaps. A minimum dataset for surgical handover should include the patient's name, location (ward and bed number), date of admission, diagnosis, procedure (with date), complications and progress, management plan, resuscitation plan, consultant availability (and instructions if not available), expected need for review, and name of doctor completing handover and date to confirm that information is current. An electronic handover system is a potential solution, but the survey shows that free-text entry into such systems may be inadequate; prompts or predefined fields for handover content are possible solutions.

Frank G, Lawless ST, Steinberg TH. Improving physician communication through an automated, integrated sign-out system. J Healthc Inf Manag. 2005 Fall;19(4):68-74.

Communication failures among physicians are a leading cause of medical errors. The resident sign-out sheet is the primary tool used by house staff to facilitate the sign-out process. The resident sign-out sheet is a structured report, with patient-specific information including demographics, such as a patient's name, age, sex, room number, and attending physician; problem list; medications; and allergies. Some physicians use handwritten notes to keep track of this information, while others use freestanding word processor or database programs. In a previous study, the authors described serious inaccuracies in a manually updated word-processor based resident sign-out sheet used by pediatric residents at a tertiary-care children's hospital. An automated and integrated sign-out system (AISS) was subsequently developed that retrieves pertinent patient information from a computerized provider order entry (CPOE) system. The AISS generates a resident sign-out sheet, which includes demographic information, weight, current medications, allergies, and diet orders, as well as optional free-text information. The AISS has proven to be enormously popular, increasing physician acceptance of CPOE throughout the organization. This paper discusses lessons learned, including technical, design, and workflow aspects of an integrated resident sign-out sheet. The authors recommend that all future commercial CPOE systems incorporate physician sign-out tools such as the one described in this article.

Van Eaton EG, Horvath KD, Lober WB, Rossini AJ, Pellegrini CA. A randomized, controlled trial evaluating the impact of a computerized rounding and sign-out system on continuity of care and resident work hours. J Am Coll Surg. 2005 Apr;200(4):538-45.

Adoption of limits on resident work hours prompted the authors to develop a centralized, Web-based computerized rounding and sign-out system (UWCores) that securely stores sign-out information; automatically downloads patient data (vital signs, laboratories); and prints them to rounding, sign-out, and progress note templates. The authors tested the hypothesis that this tool would positively impact continuity of care and resident workflow by improving team communication involving patient handovers and streamlining inefficiencies, such as hand-copying patient data during work before rounds ("prerounds"). Fourteen inpatient resident teams (6 general surgery, 8 internal medicine) at two teaching hospitals participated in a 5-month, prospective, randomized, crossover study. Data collected included number of patients missed on resident rounds, subjective continuity of care quality and workflow efficiency with and without UWCores, and daily self-reported prerounding and rounding times and tasks. UWCores halved the number of patients missed on resident rounds (2.5 versus 5 patients/team/month, $p = 0.0001$); residents spent 40% more of their prerounds time seeing patients ($p = 0.36$); residents reported better sign-out quality (69.6% agree or strongly agree); and improved continuity of care (66.1% agree or strongly agree). UWCores halved the portion of prerounding time spent hand-copying basic data ($p < 0.0001$); it shortened team rounds by 1.5 minutes/patient ($p = 0.0006$); and residents reported finishing their work sooner using UWCores (82.1% agree or strongly agree). This system enhances patient care by decreasing patients missed on resident rounds and improving resident-reported quality of sign-out and continuity of care. It decreases by up to 3 hours per week (range 1.5 to 3) the time used by residents to complete rounds; it diverts prerounding time from recopying data to more productive tasks; and it facilitates meeting the 80-hour work week requirement by helping residents finish their work sooner.

Van Eaton EG, Horvath KD, Lober WB, Pellegrini CA. Organizing the transfer of patient care information: the development of a computerized resident sign-out system. Surgery. 2004 Jul;136(1):5-13.

The problem of safe and efficient transfer of care has increased over the years as new and complex diagnostic tools and more complex treatment options became available. Traditionally, residents ensured continuity of care by working long hours and minimizing the transfer of significant diagnostic or therapeutic responsibilities to other providers. The new 80-hour workweek has curtailed that practice and increased the pressure on trainees for workflow efficiency. The authors report on a study of information-handling routines among residents for the separate tasks of transfer of care ("sign-out") and daily patient care work (ward work). Using these results, an institution-wide computerized system was developed to centralize information-handling tasks and facilitate the management and transfer of patient care information. House staff from 31 resident-run inpatient and consult services at 2 teaching hospitals described current methods of maintaining patient information used during ward rounds and during sign-out. A subgroup of 28 residents then participated in the design of a computerized resident sign-out system to centralize patient information and produce lists for rounding and transferring care duties. Accuracy, flexibility, and portability were identified as key elements by the design team. Analysis of the type of information handled by residents caring for inpatients demonstrated common elements across many services. Most services used a paper patient list to manage both nightly sign-out and daily ward work, which required repeated recopying of patient data during the day. Utilizing medical information systems tools and rapid application development concepts, the authors constructed a computerized resident sign-out system ("UWCores"). This system combines the patient sign-out and daily ward work information in one central location. The authors believed this would improve the quality of information transferred during sign-out and enhance resident efficiency. During the design process, the authors identified rules that govern the type of clinical information that should be automatically versus manually updated. The authors observed an immediate acceptance by all residents and services that tried the system. This

study shows that by combining downloaded patient data from hospital systems with resident-entered patient details, a computerized resident sign-out system can be a feasible, powerful, and popular tool. While its effect on patient safety and resident efficiency await the results of further studies, the study shows that this tool rapidly captured the attention of resident physicians and became widely used as a valuable means to centralize and organize sign-out and daily ward work information.

Ash JS, Berg M, Coiera E. J Some unintended consequences of information technology in health care: the nature of patient care information system-related errors. Am Med Inform Assoc. 2004 Mar-Apr;11(2):104-12.

Medical error reduction is an international issue, as is the implementation of patient care information systems (PCISs) as a potential means to achieving it. As researchers conducting separate studies in the United States, The Netherlands, and Australia, using similar qualitative methods to investigate implementing PCISs, the authors have encountered many instances in which PCIS applications seem to foster errors rather than reduce their likelihood. The authors describe the kinds of silent errors they have witnessed and, from their different social science perspectives (information science, sociology, and cognitive science), they interpret the nature of these errors. The errors fall into two main categories: those in the process of entering and retrieving information, and those in the communication and coordination process that the PCIS is supposed to support. The authors believe that with a heightened awareness of these issues, informaticians can educate, design systems, implement, and conduct research in such a way that they might be able to avoid the unintended consequences of these subtle silent errors.

Kannry J, Moore C, Karson T. Discharge communiqué: use of a workflow byproduct to generate an interim discharge summary. AMIA Annu Symp Proc. 2003;;341-5.

Medical problems left unresolved during hospitalizations (along with recommended outpatient evaluations, test results pending at discharge, and discharge medication regimens) are often documented in patients' discharge summaries. However, studies have demonstrated that discharge summaries are frequently unavailable or inaccessible at post discharge visit(s). Interim discharge summaries have been shown to improve the flow of information between inpatient and outpatient physicians. The authors have constructed a web-based solution, discharge communiqués that are very much like interim discharge summaries but are an automatic byproduct of an every day workflow process, signout. The New SignOut System captures signout information and generates discharge communiqués immediately upon discharge. From June 2002-January 2003 7926 discharge communiqués were made available on 7926 patients and there were 12,920 look-ups of communiqués. Studies concur that 40-50% of patients will not have an available discharge summary making communiqués the primary source of clinical information on prior hospitalization for outpatient physicians.

Klapper B, Lecher S, Schaeffer D, Koch U. Patient records: supporting interprofessional communication in hospital [Article in German]. Pflege. 2001 Dec;14(6):387-93.

Complete and continuous documentation in patient records is an important condition for adequate communication with patients, between the professions concerned and to ensure the quality of the following working steps in care provision. Part of a German research project concerning the interprofessional communication in hospital was therefore to analyze the use of the documentation system. 54 users were asked about practical aspects of their documentation system and 450 patient records were evaluated. The analysis focused on the medical and nursing documentation of admission, process and discharge. Deficits that need to be improved appeared first of all in the practical aspects of the documentation system, the flow of information between the professions, in specific gaps of medical and nursing admission, documentation of process and discharge. Quality management is asked to improve and develop the documentation in collaboration with the users and to consider specific problems when introducing computer based records.

Kannry J, Moore C. MediSign: using a web-based SignOut System to improve provider identification. Proc AMIA Symp. 1999;:550-4.

Continuity of care necessitates communication between the primary providers of inpatient and outpatient care. Communication requires identification of providers in addition to clinical information. The authors have constructed a web-based SignOut System to improve provider identification. The web-based SignOut System correctly identified the provider for 100% (34/34) of patients in 1997 and 93% (37/40) of patients in 1998. The hospital bed census correctly identified the attending provider for 50% (17/34) of patients in 1997 and 73% (29/40) in 1998. When analyzed by attending type (i.e., service and private,) the SignOut System correctly identified 86% of service providers in contrast to the hospital bed census that correctly identified 57% of service providers. Both the SignOut System (100%) and the hospital bed census (95%) had superior results in identifying private attendings. The web-based technology provides a familiar user interface and ubiquitous workstation access.

Petersen LA, Orav EJ, Teich JM, O'Neil AC, Brennan TA. Using a computerized sign-out program to improve continuity of inpatient care and prevent adverse events. Jt Comm J Qual Improv. 1998 Feb;24(2):77-87.

Many medical injuries are preventable, but there are few reported successful strategies to prevent such injuries. Previous work identified coverage by house staff not primarily responsible for the patient (cross-coverage) as a significant correlate of risk for preventable adverse events. A four-month intervention--computerized sign-outs--was introduced in 1993 in an urban teaching hospital to improve continuity of care during cross-coverage and thereby reduce risk for preventable adverse events. A previously tested confidential self-report system was used to identify adverse events, which were defined as unexpected complications of medical therapy that resulted in increased length of stay or disability at discharge. A panel of three board-certified internists confirmed events and evaluated preventability based on case summaries. After the intervention, the rate of preventable adverse events among the 3,747 patients admitted to the medical service decreased from 1.7% to 1.2% ($p < 0.10$). Both univariate and multivariate analysis revealed no association between cross coverage and preventable adverse events after the intervention. In the baseline period, the odds ratio (OR) for a patient suffering a preventable adverse event during cross coverage was 5.2 (95% confidence interval [CI], 1.5-18.2; $p = 0.01$), but was no longer significant after the intervention (OR, 1.5; 95% CI, 0.2-9.0). House staff are willing participants in efforts to measure and improve the quality of health care systems. The intervention may have reduced the risk for medical injury associated with discontinuity of inpatients care. Four years after the end of the study, the computerized sign-out program remained an integral part of the computing support system for house staff and was widely used.

Lee LH, Levine JA, Schultz HJ. Utility of a standardized sign-out card for new medical interns. J Gen Intern Med. 1996 Dec;11(12):753-5.

Conscientious sign-out between medical interns is important for the continuity of care of hospitalized patients. The authors developed a standardized sign-out card that prompted the intern going off duty to transmit patient care information to the intern on call. The card was tested in a pro-spective, randomized, controlled trial in which one group of interns used the card, and another group did not. Any instance of poor sign-out was reported on a questionnaire completed by the intern who had been on call the previous night. The group using the sign-out cards reported poor sign-out on 8 nights (5.8% of questionnaires), and the control group reported it on 17 nights (14.9% of questionnaires, $p = .016$). The card was time-effective and inexpensive, resulted in more complete data recording, and possibly decreased the morbidity associated with poor sign-out.

Hiltz FL, Teich JM. Coverage List: a provider-patient database supporting advanced hospital information services. Proc Annu Symp Comput Appl Med Care. 1994;809-13.

The authors have developed a provider-patient database system, known as Coverage List, which maintains the associations between house staff and inpatients in a teaching hospital. Coverage List automatically links each patient to the proper resident when the patient is admitted, and updates the linkage whenever the resident coverage changes due to night or weekend coverage, physician illness, changes in clinical rotations, and other factors. Using this association, decision-support applications that detect significant clinical events can transmit them directly to the responsible resident. Sign-out and patient-review systems, which collect information on all of a physician's patients, always know the patients for whom that physician is responsible. Nurses who need to contact a physician about a patient issue always know which physician is covering that patient. Coverage List also manages schedule entry and display for physicians, or for any other staff members. A physician can enter individual schedule changes, sign out her service and her pager for the day, and page consultants automatically without going through an operator. These functions support clinical practice directly and enhance the value of other clinical programs.

Ram R, Block B. Signing out patients for off-hours coverage: comparison of manual and computer-aided methods. Proc Annu Symp Comput Appl Med Care. 1992:114-8.

This paper evaluates the communication of information to physicians who provide off-hours coverage to inpatients in two Family Practice residency programs. To describe the importance and accessibility of clinical information used by on-call residents in covering hospital patients, the authors administered a questionnaire. Then following the use of a new computerized sign-out system in one of the programs, residents filled out the same questionnaire again. Residents felt that a "to do" list and information about the patient's "code status" were the most important data desired from sign-out sheets. However, 69% of residents in both programs felt that provision of this information was normally poor. Nearly all of the residents in Buffalo, using an entirely handwritten sign-out sheet, felt it was in need of improvement. Residents in Pittsburgh, using a summary aided by the hospital's computer print-out, felt this need much less acutely. After implementation of a new computerized sign-out sheet in Buffalo, residents indicated a slightly higher level of satisfaction. The work of data entry and re-entry into the computer was unpopular and inefficient. The present method of transferring information at the end of a work day is not satisfactory for residents. Provision of data summaries from existing hospital information systems is a good first step in improving data transfer. A further study of more comprehensive automated sign-out systems is important, because of the increasing discontinuity of house officer care.

Laboratory Studies on the Accuracy of Information and Effect on Decisions

Christensen C, Larson JR Jr, Abbott A, Ardolino A, Franz T, Pfeiffer C. Decision making of clinical teams: communication patterns and diagnostic error. Med Decis Making. 2000 Jan-Mar;20(1):45-50.

This study examined the discussion of information among mixed-status clinical teams while constructing differential diagnoses. Twenty-four ad hoc teams, each consisting of a resident, an intern, and a third-year medical student, were given two hypothetical patient cases to discuss and diagnose. Prior to discussion, team members individually viewed different versions of a videotaped interview with a "patient" (trained actor). Each videotape contained some information that was present in all three versions (shared information) and some that was present in only that version (unique information). In addition, half of the time, the cases were constructed so that the unique information that appeared in only one tape was crucial for a correct diagnosis (a "hidden profile" condition). After viewing the videotapes, team members met to discuss the case and develop a differential diagnosis. Discussions were videotaped and analyzed. Overall, shared information was mentioned more often than unique information ($p < 0.0001$). Furthermore, teams offered incorrect diagnoses significantly more often for hidden-profile cases than for control cases ($p < 0.01$). The teams' overreliance on previously shared information (inability to appropriately utilize unique information) was detrimental when a correct diagnosis demanded the

inclusion of such information. Clinical discussions that require the consideration of uniquely held information may be susceptible to error.

Larson E, Hamilton HE, Mitchell K, Eisenberg J. Hospitalk: an exploratory study to assess what is said and what is heard between physicians and nurses. Clin Perform Qual Health Care. 1998 Oct-Dec;6(4):183-9.

Collaboration and effective communication between healthcare professionals has been demonstrated to improve patient outcomes and job satisfaction. The purpose of this study was to examine physician and nurse communication in a hospital setting during a time of very rapid change. The data sources and study setting were full-time attending internal medicine physicians (n = 5), registered nurses (n = 18), and medical residents (n = 12) working on two adult medical units in a 325-bed tertiary-care hospital in the mid-Atlantic region from fall 1996 to summer 1997. In this descriptive survey and interview, each subject completed a written questionnaire, Physician-Nurse Communication Scale, and a structured interview with a trained social linguistics team. Physicians and nurses shared similar perceptions regarding their roles in communication processes, such as giving orders, asking for information, and asking for and giving opinions. They differed significantly in the perceptions of the physician and nurse roles in giving information, orienting, and providing education. Generally, physicians perceived that nurses initiated certain types of communication significantly less often than did nurses. Both groups expressed an interest in more interaction; nurses particularly expressed the need to be "listened to" or respected more. Nurses were significantly more likely to express the need to change interactions with house staff than with attending physicians (P = .02). Interactions between physicians and nurses are perceived differently by the two groups, leading to misunderstanding of motive and meaning. Recommendations are made to improve communication between these two professional groups.

Larson JR Jr, Christensen C, Franz TM, Abbott AS. Diagnosing groups: the pooling, management, and impact of shared and unshared case information in team-based medical decision making. J Pers Soc Psychol. 1998 Jul;75(1):93-108.

The impact of group discussion on the decision-making effectiveness of medical teams was examined. Three-person teams of physicians diagnosed 2 hypothetical medical cases. Some of the information about each case was given to all team members prior to discussion (shared information), whereas the rest was divided among them (unshared information). Compared with unshared information, shared information was more likely to be pooled during discussion and was pooled earlier. In addition, team leaders were consistently more likely than other members to ask questions and to repeat shared information and, over time, also became more likely than others to repeat unshared information. Finally, pooling unshared (but not shared) information improved the overall accuracy of the team diagnoses, whereas repeating both shared and unshared information affected bias (but not accuracy) in the diagnoses.

Larson JR Jr, Christensen C, Abbott AS, Franz TM. Diagnosing groups: charting the flow of information in medical decision-making teams. J Pers Soc Psychol. 1996 Aug;71(2):315-30.

Several hypotheses derived from an information sampling model of group discussion were tested with 3-person teams of physicians given 2 hypothetical medical cases to diagnose. Some of the information about each case was given to all 3 team members before discussion (shared information), whereas the rest was divided among them (unshared information). As predicted, shared information was, overall, more likely to be discussed than unshared information, and it was brought into discussion earlier. In addition, it was found that team leaders repeated substantially more case information than did other members and that, over time, they repeated unshared information at a steadily increasing rate. The latter findings are interpreted as evidence of leaders' information management role in problem-solving discussions.

Literature Reviews

Lyndon A. Communication and teamwork in patient care: how much can we learn from aviation? J Obstet Gynecol Neonatal Nurs. 2006 Jul-Aug;35(4):538-46.

The objective was to identify evidence on the role of assertiveness and teamwork and the application of aviation industry techniques to improve patient safety for inpatient obstetric care. Studies limited to research with humans in English language retrieved from CINAHL, PubMed, Social Science Abstracts, and Social Sciences Citation Index, and references from reviewed articles. A total of 13 studies were reviewed, including 5 studies of teamwork, communication, and safety attitudes in aviation; 2 studies comparing these factors in aviation and health care; and 6 studies of assertive behavior and decision making by nurses. Studies lacking methodological rigor or focusing on medication errors and deviant behavior were excluded. Pilot attitudes regarding interpersonal interaction on the flight deck predicted effective performance and were amenable to behavior-based training to improve team performance. Nursing knowledge was inconsistently accessed in decision making. Findings regarding nurse assertiveness were mixed. Adaptation of training concepts and safety methods from other fields will have limited impact on perinatal safety without an examination of the contextual experiences of nurses and other health care providers in working to prevent patient harm.

Scallan S. Education and the working patterns of junior doctors in the UK: a review of the literature. Med Educ. 2003 Oct;37(10):907-12.

The objective was to identify and review UK research relating to the effects of patterns of work on the education of junior doctors, describe the trends in the research, contextualize the progress of the UK in reducing the number of hours worked by junior doctors alongside that of other countries and identify areas for future research. A total of 77 research studies, mostly written after 1995, were identified as relevant from approximately 900 references generated by searching Medline and using a 'snowball' technique. The articles identified were qualitatively reviewed to identify their key research conclusions and/or the main points of argument. These were collated and presented in a qualitative review. Research in the UK is contradictory regarding the effects of working patterns and the views of doctors towards them. Further research is needed to examine in depth the differences in the effects of working patterns on education between hard-pressed and non hard-pressed specialties, hospitals and regions. When viewed in an international context, the UK ranks among a number of countries with similar medical systems that are moving towards reducing the hours worked by doctors in training, all of which are at different points in the process. The literature review has helped to identify the popular wisdom surrounding the debate on junior doctors' hours, the progress of the UK when compared to that of other countries and gaps in research. Further research is needed to refine understanding of this area.

Nursing Hand-Offs

McFetridge B, Gillespie M, Goode D, Melby V. An exploration of the handover process of critically ill patients between nursing staff from the emergency department and the intensive care unit. Nurs Crit Care. 2007 Nov-Dec;12(6):261-9.

The transfer of information between nurses from emergency departments (EDs) and critical care units is essential to achieve a continuity of effective, individualized and safe patient care. There has been much written in the nursing literature pertaining to the function and process of patient handover in general nursing practice; however, no studies were found pertaining to this handover process between nurses in the ED environment and those in the critical care environment. The aim was to explore the process of patient handover between ED and intensive care unit (ICU) nurses when transferring a patient from ED to the ICU. This study used a multi-method design that combined documentation review, semistructured individual interviews and focus group interviews. A multi-method approach combining individual interviews, focus group interviews and documentation review was used in this study. The respondents were selected from the ED

and ICU of two acute hospitals within Northern Ireland. A total of 12 respondents were selected for individual interviews, three nurses from ED and ICU, respectively, from each acute hospital. Two focus groups interviews were carried out, each consisting of four ED and four ICU nurses, respectively. Qualitative analysis of the data revealed that there was no structured and consistent approach to how handovers actually occurred. Nurses from both ED and ICU lacked clarity as to when the actual handover process began. Nurses from both settings recognized the importance of the information given and received during handover and deemed it to have an important role in influencing quality and continuity of care. Nurses from both departments would benefit from a structured framework or aide memoir to guide the handover process. Collaborative work between the nursing teams in both departments would further enhance understanding of each others' roles and expectations.

Meissner A, Hasselhorn HM, Estryn-Behar M, Nézet O, Pokorski J, Gould D. Nurses' perception of shift handovers in Europe: results from the European Nurses' Early Exit Study. J Adv Nurs. 2007 Mar;57(5):535-42.

This paper reports a study exploring nurses' perceptions of the shift handover and the possible reasons for reported dissatisfaction in 10 European countries. The nursing handover fulfils a number of purposes and has important consequences for the continuity of patient care and nurses' satisfaction with the quality of care they are able to provide. However, the performance and function of shift handovers in health care is a widely neglected topic in practice and research. The Nurses' Early Exit Study (<http://www.next-study.net>) investigates the working conditions of nurses and variables influencing nursing retention. The data for this analysis were collected between 2002 and 2003 by self-report questionnaires in 10 European countries.

The percentage of nurses dissatisfied with shift handovers ranged from 22% in England to 61% in France. In most countries the main reason for dissatisfaction with shift handovers was 'too many disturbances', followed by 'lack of time'. Most countries showed similar associations of dissatisfaction with qualification level and occupational seniority, but not with position and type of shift. 'Poor quality of leadership' and 'poor support from colleagues', were strongly associated with dissatisfaction. In several (but not all) European countries, shift handovers may be a frequent cause for nurses' irritation. The underlying causes appear to be of an organizational nature. The findings have implications for solutions. Further debate and research should clarify the different purposes of shift handovers and relate them to handover style and to the quality of patient care.

Shendell-Falik N, Feinson M, Mohr BJ. Enhancing patient safety: improving the patient handoff process through appreciative inquiry. J Nurs Adm. 2007 Feb;37(2):95-104.

Patient transfers from one care giver to another are an area of high safety consequence, as is evident by many studies and the Joint Commission on Accreditation of Healthcare Organization's Patient Safety Goals. The authors describe how one hospital made measurable improvements in a patient handoff process by using an unconventional approach to change called appreciative inquiry. Rather than identifying the root causes of ineffective handoffs, appreciative inquiry was used to engage staff in identifying and building on their most effective handoff experiences.

Strople B, Ottani P. Can technology improve intershift report? What the research reveals. J Prof Nurs. 2006 May-Jun;22(3):197-204.

Shift report is a multifaceted process that serves to provide nurses with vital patient information to facilitate clinical decisions and patient care planning. A shift report also provides nurses with a forum for functions, such as patient problem solving and collaboration. The authors conducted a literature review, which indicates that current methodologies used to collect and convey patient information are ineffective and may contribute to negative patient outcomes. Data incongruence, legal implications, time constraints augmented by the nursing shortage, and the financial impact of shift report are also addressed. The literature reveals significant rationale for pioneering new and innovative methods of shift-to-shift communication. In the report *To Err is Human: Building a Safe Health System*, the Institute of Medicine attributes the deaths of up to 98,000 hospitalized Americans to medical errors, including communication failures [Institute of Medicine. (1999). *To*

err is human: Building a safe health system. Report by the Committee on Quality of Health Care in America. Washington, DC: National Academy Press]. As a result, government policy makers and health care agencies have focused their attention on determining the root cause of errors to identify preventative measures, including the use of information technology [Institute of Medicine. (2004). Keeping patients safe: Transforming the work environment of nurses. Report by the Committee on Quality of Health Care in America. Washington, DC: National Academy Press]. Under these premises, the authors examined the process of nursing shift report and how it impacts patient outcomes. The use of computer technology and wireless modes of communication is explored as a means of improving the shift report process and, subsequently, health care outcomes and patient safety.

Anderson CD, Mangino RR. Nurse shift report: who says you can't talk in front of the patient? Nurs Adm Q. 2006 Apr-Jun;30(2):112-22.

Bedside nurse shift report is a process where nurses provide shift-to-shift report at the patient's bedside so the patient can be more involved in his or her care. There are many benefits of bedside report, including relationship building between staff members and increased patient satisfaction, to both the patient and to the healthcare team. Concerns about the traditional methods of communication between the various shifts helped drive a nursing unit's decision to move to a more patient-involved model of shift-to-shift report. The change from the traditional taped report between healthcare providers to bedside reporting focused on patients wanting more involvement in their care, activities, and current status. Patients also wanted updates about their health status, their medical plan as well as information about their progress toward their goals. This, coupled with Banner Desert Medical Center's Care Model, embraces patient-centered care, King's Theory of Goal Attainment, and keeps the patient informed. The current nursing shift report did not meet the medical center's model of care on any of these aspects. This article will include information on the benefits of bedside nurse shift-to-shift report, how one unit implemented bedside reporting, and some of the outcomes achieved after implementing this change at a 600-bed urban medical center.

Philpin S. 'Handing over': transmission of information between nurses in an intensive therapy unit. Nurs Crit Care. 2006 Mar-Apr;11(2):86-93.

Transferring end of shift information between nurses via both verbal and written routes in an intensive therapy unit (ITU) setting is complex and multifaceted. Some authors have taken ethnographic approaches and explored the verbal handover as an example of a nursing ritual. The written route involves various textual materials, which, in addition to conveying essential information about the patient's status, also represent other messages. This article considers two key areas of end of shift information transmission - verbal bedside handovers and written accounts - arguing that in addition to the manifest purposes of transferring essential information between nurses, both modes of reporting also have important latent functions. It will explore and interpret elements of ritual and symbolism inherent in both forms of handover. The article reports on particular findings from a larger ethnographic study of nursing culture, which was accomplished through participant observation over a 12-month period in ITU. Subsidiary components of the ethnography were the interviews with 15 nurses and the examination of documentary material. The findings suggest that both verbal and written reports, in addition to ensuring that nurses taking over the care of the patient receive the necessary information to enable them to safely provide continuity of care, also convey essential meanings and articulate group values. Both modes of handover reporting are also visual and/or audible symbolic representations of nursing care in ITU and as such confirm and validate that care, expressing the value of nursing work in this unit.

Davies S, Priestley MJ. A reflective evaluation of patient handover practices. Nurs Stand. 2006 Feb 1-7;20(21):49-52.

This article is a personal reflection of the patient handover process. It explores approaches to handover, issues of time management, documentation and phenomenology. A handover sheet was

developed with the assistance of a nursing team to maximize communication during handover. By observing patients, referring to documentation and listening to the practitioner presenting the handover, nurses can improve the handover process and care delivery.

Helles Å, R. Information handling in the nursing discharge note. J Clin Nurs. 2006 Jan;15(1):11-21.

The aim of this paper is twofold. Firstly, it describes hospital nurses' general use of the language function in the nursing discharge notes of patients who will require post hospital home health care. Secondly, it addresses the similarities and differences in completeness, structure and content between paper and electronic nursing discharge notes. Previous research has identified gaps in the accuracy and relevance of information communicated between nurses working at different organizational levels. A descriptive design with a text analysis framework was used. The study shows that the text in the nursing discharge notes is information-dense and characterized by technical terms, although the nurses contextualized and individualized the content of the terms to clarify the message. Both similarities and differences were found in range and detail of the information nurses exchanged when they used paper or electronic discharge notes. The use of structured and standardized templates helped nurses improve the completeness, structure and content of the information in the nursing discharge notes. Whether paper or electronic documentation is used, the findings in this study highlight the challenges nurses encounter in ensuring continuity of care during patients' trajectory through the health system. The findings may help clarify the appropriateness of the content and language nurses use in the nursing discharge note as a communication medium. This study may also be helpful to nurses planning to use EPRs, as it illustrates some of the issues which should be clarified before this is implemented.

Pothier D, Monteiro P, Mooktiar M, Shaw A. Pilot study to show the loss of important data in nursing handover. Br J Nurs. 2005 Nov10-23;14(20):1090-3.

A good nursing handover process is a crucial part of providing quality nursing care in a modern healthcare environment. The conservation of patient data during the handover process is vital to ensure good continuity of care and safe practice. Any errors or omissions made during the handover process may have dangerous consequences. The authors observed the handover of 12 simulated patients over five consecutive handover cycles between nurses. Three handover styles were used and the amount of data loss was recorded for each style. A purely verbal handover style resulted in the loss of all data after three cycles. A note-taking style (the traditional style used in most hospital wards) resulted in only 31% of data being transferred correctly after five cycles. When a typed sheet was included with the verbal handover, data loss was minimal. Current handover methods may result in significant loss of important data that may impact on patient care. The authors recommend that prior to handover, a formal handover sheet be constructed that can be transferred as part of the handover process.

Bruce K, Suserud BO. The handover process and triage of ambulance-borne patients: the experiences of emergency nurses. Nurs Crit Care. 2005 Jul-Aug;10(4):201-9.

One of the most important tasks that a nurse faces in the emergency room, when receiving a patient, is handover and the triage function. The aim of the study was to explore the experiences of nurses receiving patients who were brought into hospital as emergencies by ambulance crews through an analysis of the handover and triage process. A qualitative descriptive interview study inspired by the phenomenological method was used with six emergency nurses. There are three elements to a handover: a verbal report, handing over documented accounts and the final symbolic handover when a patient is transferred from the ambulance stretcher onto the hospital stretcher. The study identified that the verbal communication between ambulance and emergency nurses was often very structured. The ideal handovers often involved patients with very distinct medical problems. The difficult handover or the 'non-ideal' one was characterized by a significantly more complicated care situation. The handover function was pivotal in ensuring that the patient received the correct care and that care was provided at the appropriate level. The most seriously afflicted patients arrived by ambulance; therefore, the interplay between pre-hospital

and hospital personnel was vital in conveying this important information. To some extent, this functioned well, but this research has identified areas where this care can be improved.

Sexton A, Chan C, Elliott M, Stuart J, Jayasuriya R, Crookes P. Nursing handovers: do we really need them? J Nurs Manag. 2004 Jan;12(1):37-42.

This study attempts to address the content of nursing handover when compared with formal documentation sources. The nursing handover has attracted criticism in the literature in relation to its continuing role in modern nursing. Criticisms include those related to time expenditure, content, accuracy and the derogatory terms in which patients are sometimes being discussed. Twenty-three handovers, covering all shifts, from one general medical ward were audio-taped. Their content was analyzed and classified according to where, within a ward's documentation systems, the information conveyed could be located. Results showed that almost 84.6% of information discussed could be located within existing ward documentation structures and 9.5% of information discussed was not relevant to ongoing patient care. Only 5.9% of handover content involved discussions related to ongoing care or ward management issues that could not be recorded in an existing documentation source. The results of this study are representative of only one ward in one Australian Hospital. Specific documentation sources were also not checked to determine their content. Streamlining the nursing handover may improve the quality of the information presented and reduce the amount of time spent in handover.

Dowding D. Examining the effects that manipulating information given in the change of shift report has on nurses' care planning ability. J Adv Nurs. 2001 Mar;33(6):836-46.

The aim of the study was to investigate the effect that manipulating the style and content of the nurse change of shift report had on an individual's ability to plan patient care. The nurse change of shift report occurs on most hospital wards at least two if not three times a day. However, little research exists examining how changing the style and information content of the shift report may affect an individual's ability to process the information they hear. It is suggested that how individuals structure their knowledge, in the form of schema, is an important consideration when examining how they process information. This was an experimental study where two independent variables, report style (retrospective vs. prospective) and schema information (schema consistent vs. schema inconsistent) were compared in a factorial design. A convenience sample of 48 registered nurses from acute medical and acute surgical wards were randomly allocated to one of the four experimental conditions. Outcome measures included the amount of information that subjects accurately recorded and recalled from the shift report, together with their ability to plan patient care. Results indicated that the type of report had a significant effect on an individual's ability to plan patient care, and type of information content on their ability to accurately record and recall the information they heard. The implications of the results, both for schema theory as an explanation of nursing knowledge, and for the type of report which should be used in acute medical and acute surgical wards are discussed, together with the implications of the study for further research.

Manias E, Street A. The handover: uncovering the hidden practices of nurses. Intensive Crit Care Nurs. 2000 Dec;16(6):373-83.

This paper considers the ways in which the nursing handover involves a complex network of communication that impacts on nursing interactions. The critical ethnographic study upon which this paper is based involved a research group of six nurses who worked in one critical care unit. Data-collection methods involved professional journaling, participant observation, and individual and focus group interviews. The nursing handover took on many forms and served different purposes. At the start of a shift, the nurse coordinator of the previous shift presented a 'global' handover of all patients to oncoming nurses. Nurses proceeded then to the bedside handover, where the intention changed from one that involved a broad overview of patients, to one that concentrated on a patient's individual needs. Data analysis identified five practices for consideration: the global handover serving the needs of nurse coordinators; the examination; the tyranny of tidiness; the tyranny of busyness; and the need to create a sense of finality. In

challenging nurses' understanding of these practices, they can become more sensitive to other nurses' needs, thus promoting the handover process as a site for collaborative and supportive communication.

Payne S, Hardey M, Coleman P. Interactions between nurses during handovers in elderly care. *J Adv Nurs.* 2000 Aug;32(2):277-85.

This paper explores the role of nursing interaction within the context of handovers and seeks to identify the clinical discourses used by registered nurses, student nurses and care assistants in acute elderly care wards, to determine their influence on the delivery of patient care. The study design involved an ethnographic approach to data collection which involved: observations of formal nursing end of shift reports (23 handovers) and informal interactions between nurses (146 hours); interviews (n = 34) with registered nurses, student nurses and care assistants; and analysis of written nursing records. A grounded theory analysis was undertaken. Data were collected from five acute elderly care wards at a district general hospital in the south of England. Results from this empirical study indicate that handovers were formulaic, partial, cryptic, given at high speed, used abbreviations and jargon, required socialized knowledge to interpret, prioritized biomedical accounts and emphasized physical aspects of care. Patients' resuscitation status was highly salient to all grades of nurse. Doing 'paperwork' was accorded less status and priority than patient care, and was regarded as excessively time consuming. Despite this, there was evidence of repetition in nursing documents. Moreover, the delivery of clinical nursing appeared to be guided by personal records rather than formal records.

Lamond D. The information content of the nurse change of shift report: a comparative study. *J Adv Nurs.* 2000 Apr;31(4):794-804.

This study examines the role which the nursing change of shift report may have in aiding nurses to process information and plan care. It also aims to identify whether any of the information found in the shift report can be considered as 'forceful feature' information, the key features of a situation which allow an individual to access appropriate knowledge within their long-term memory store. The content of the medical notes, nursing documentation and shift reports for a total of 60 patients, selected from two acute medical and two acute surgical wards across two National Health Service Hospital Trusts in south-east England were subjected to content analysis. The types and amount of information contained in each source were examined, along with the order of information given in the shift reports. A multidimensional scalogram analysis (MSA) was also carried out on the data to examine the patterns of information content across sources. In general, more information was recorded in the patients' notes than communicated during the shift report. However, both the frequency data and the MSA plots indicated that particular types of information (identified here as global judgments) were often communicated in the shift report but not recorded in the patient notes. The results suggest that there is evidence that the change of shift report contains 'forceful feature' information. The presence of such 'forceful features' may facilitate the processing of patient information during the shift report communication, leading to more efficient care planning.

Lally S. An investigation into the functions of nurses' communication at the inter-shift handover. *J Nurs Manag.* 1999 Jan;7(1):29-36.

This study set out to investigate the functions of nurses' communication at the inter-shift handover. The inter-shift handover should facilitate continuity in care by transferring patient information between shifts. However, nurses may also use this time for team building. An observational study was conducted during six inter-shift handovers occurring on one ward in a general hospital in the UK. The data was transcribed and a thematic analysis applied. The main themes related to the transfer of patient information and team building, the strongest theme being team building. Nurses were found to communicate goals and values relating to nursing practice so facilitating cohesiveness of the nursing team. The nursing ritual of inter-shift handover serves the purpose of enhancing a shared value system amongst nurses. It should therefore not be regarded as an outdated means of communication.

Miller C. Ensuring continuing care: styles and efficiency of the handover process. Aust J Adv Nurs. 1998 Sep-Nov;16(1):23-7.

Handover is seen as an important part of each nurse's shift, not only for information sharing, but from the resource management aspect of both the time and the subsequent financial cost of nurses being involved. This article discusses the four main styles of handover reported in the nursing literature over the past 15 years. These are referred to as the recorded, the bedside, the written and the verbal (traditional). It also comments on 'what to say advice', 'ritual' and 'quality' aspects of handover, which have a bearing on the efficiency of the handover process. This review highlights three recommendations that could aid in maintaining an efficient process. These are: regular reviews of the handover process; written guidelines for the content of handover; and the use of a pre-prepared handover sheet.

Cahill J. Patient's perceptions of bedside handovers. J Clin Nurs. 1998 Jul;7(4):351-9.

The bedside handover is a universal phenomenon in nearly every type of care setting. It has become the chief arena for the intershift handover in contemporary nursing practice. Published literature investigating patients' viewpoints on the location of the bedside handover is sparse. The overall aim of this study is to describe and provide an analysis of patients' perceptions of the bedside handover. A grounded theory approach to data collection and data analysis was employed to capture surgical patients' views about the bedside handover. The analysis tentatively suggests the existence of three categories that describe the patients' perceptions of the bedside handover.

McKenna L, Walsh K. Changing handover practices: one private hospital's experiences. Int J Nurs Pract. 1997 Jun;3(2):128-32.

The handover practice has long been an important component of clinical nursing practice allowing nurses to exchange relevant client information from one shift to the next and ensure continuity of patient care. Traditional approaches have seen nursing handovers taking place in a room away from general ward activity. Oncoming nursing staff receive the information verbally from nurses on the previous shift about all patients within the ward or unit. This practice has been proven over time to present difficulties and consequently, many hospitals are choosing to adopt models that better address current needs. This analysis describes the creative approaches taken by one private hospital in modifying handover practices with the view to reduce time and increase overall efficiency and effectiveness, whilst ensuring that staff and ward requirements are considered. The study highlights how action research principles can be applied to introduce change into the clinical practice environment.

McKenna LG. Improving the nursing handover report. Prof Nurse. 1997 Jun;12(9):637-9.

The nursing handover report is a vital method of passing on essential information to nurses on the next shift. Nursing handover reports traditionally take place in private; they can become lengthy, irrelevant or unprofessional. Alternative methods of handover, such as bedside reporting, or tape-recording or writing reports, can help refine the process and make it more relevant to practice.

Magalhães AM, Pires Cda S, Keretzky KB. The opinion of nurses concerning the shift transfer [Article in Portuguese]. Rev Gaucha Enferm. 1997 Jan;18(1):43-53.

The study intends to survey nurse's opinions regarding shift changes in their workplaces. It aims deepening the knowledge about how this activity contributes to the work organization, considering the process of caring in nursing. The authors emphasize the importance of shift change and of data gathered by nursing staff as a connecting link of the health system. They are fundamental activities for the unit work organization, being a decisive factor to maintain the quality of the assistance, since they allow updating information about the patient and nursing actions adjustment.

Strange F. Handover: an ethnographic study of ritual in nursing practice. Intensive Crit Care Nurs. 1996 Apr;12(2):106-12.

Three times every day in most of the hospitals and nursing homes in the UK, the so-called ritual of handover takes place. This ethnographic study examines that practice. The handovers of one ward were observed to see if they warrant the label of ritual as described by Helman (1990). Further analysis was performed to examine the functions and meanings of this practice. The conclusion from the analysis is that this practice does merit the label of ritual. Ritual is examined in terms of its meaning and found to serve valuable psychological, social and protective functions for its unwitting participants. Ritual serves another function, it plays an important role in valuing and emphasizing what comes to constitute working nursing knowledge. In conclusion, ritual should not be dismissed by a profession which claims a holistic approach as its espoused theory, but further investigated and utilized as a means for accessing nursing knowledge.

Ekman, I., Segesten, S. Deputed power of medical control: The hidden message in the ritual of oral shift reports. J Adv Nurs. 1995 Nov;22(5):1006-11.

The exchange of oral shift reports between nurses is a prominent part of the everyday routine in a hospital ward. Increased awareness of the more or less explicit functions of such communication is likely to have a positive impact on the nursing profession. Oral shift reports in a nursing care system based on task allocation were therefore observed and analyzed. Using an ethnographic approach, reports were tape-recorded, and nurses were interviewed regarding their experiences. During the shift report session, the nurses were found to receive ritually mediated deputed power of medical control from their colleague, but little attention was paid to nursing needs and measures. The nurses clearly demonstrated that they were caught in a system dominated by a medical paradigm that effectively obstructed the progress of nursing as a professional discipline in its own right.

Patterson PK, Blehm R, Foster J, Fuglee K, Moore J. Nurse information needs for efficient care continuity across patient units. J Nurs Adm. 1995 Oct;25(10):28-36.

Continuity of care can be costly, unless information systems incorporate comprehensive patient data from all types of nursing units. This study identified nurses' communication processes and content needs when receiving patients in a large medical center averaging 3750 patient transfers monthly. A survey of 197 registered nurses in perioperative, intensive care, medical-surgical, outpatient, acute psychiatric, and long-term care settings revealed that some assessment content is considered important to all nurses, although the importance of other information can vary by specialty practice. Cost-benefit implications and planning applications are discussed.

Sherlock C. The patient handover: a study of its form, function and efficiency. Nurs Stand. 1995 Sep 20-26;9(52):33-6.

This study investigates the nature of the ward handover report. It was undertaken following observations that student nurses seemed not to receive enough knowledge to care for patients in an informed way. Data were gathered through participant observation on two busy medical wards over a period of two weeks. The data revealed a complex system of communication was necessary to allow nurses to provide continuity of care for patients in a safe manner. The handover was seen as working effectively but with scope for improvement. It was often long, lasting up to 60 minutes, and its information so comprehensive that it was difficult to assimilate in one session. It was found to be a process of variable quality due to the lack of supporting framework. The findings are discussed and recommendations are made to improve the handover's quality and effectiveness.

Research Frameworks

Behara, R., Wears, R. L., Perry, S. J., Eisenberg E. et al. 2005. A Conceptual Framework for Studying the Safety of Transitions in Emergency Care, published on the web at <http://www.ahrq.gov/qual/advances/>

In health care organizations, the division of labor and a need for continuous, 24-hour treatment subjects patients to multiple transitions in care. These transitions, or “handovers,” are potential points of failure that have seen very little study. The authors observed transitions of care in five hospital emergency departments as part of a larger study on safety in emergency care and found that in addition to many other differences in work patterns among the various hospitals, very different sorts of handovers occurred in different contexts, and these differences appeared to reflect a common structure. Using these observations, the authors have proposed a conceptual framework for characterizing handover events. The ability to characterize certain types of transitions may help to clarify future studies, while assisting in the development of interventions to better fit the context of clinical work.

Wilwerding, J. M., White, A., Apostolakis, G., Barach, P., Filippo, B. H., Graham, L. M. Modeling Techniques and Patient Safety. Paper presented at the 7th International Conference on Probabilistic Safety Assessment and Management. Berlin, June 14-18, 2004.

The authors modeled preventable adverse events associated with transitions of care. Transitions are instances in which responsibility for patient care passes from one set of agents in a hospital to another—e.g., from the Emergency Department to Intensive Care. These changes in responsibility add a layer of organizational complexity to patient care, and it is natural to suspect them of raising the likelihood of error.

The provide evidence regarding the following claims: (1) Transitions of care raise the likelihood of medical errors; (2) Transitions raise the likelihood of medical errors in part through mechanisms that generate and convey information within and between hospital units—including information regarding patients’ medical conditions and treatment; (3) It is possible to use fault and event tree models to evaluate the likelihood of preventable adverse events associated with transitions of care, and (4) By use of these models, it is possible as well to quantify the effect of transitions on the likelihood of medical error.

Sherwood G, Thomas E, Bennett DS, Lewis P. A teamwork model to promote patient safety in critical care. Crit Care Nurs Clin North Am. 2002 Dec;14(4):333-40.

To create a safe health care system, providers must understand teamwork as a complementary relationship of interdependence. Continuing efforts to adopt the aviation model will enable health care providers to examine the role of human performance factors related to fatigue, leadership, and communication among all providers. The aviation model provides a basis for designing teamwork programs to reduce error and introduces human factor principles and key skills to be learned. Health care providers need explicit instruction in communication and teamwork rather than learning by trial and error, which can instill unintended values, attitudes, and behaviors. The growing research base continues to examine the problem of health care safety and to test the most effective team training approaches. What is the most effective pattern and timing of communication among providers? What system level changes are needed in the critical care area to improve communication through teamwork and thus create a safer health care system? What are potential points of error in the daily operation that could be alleviated through effective teamwork? Continuing to test the model will ultimately change patient safety.

Smith JP, Mehta RH, Das SK, Tsai T, Karavite DJ, Russman PL, Bruckman D, Eagle KA. Effects of end-of-month admission on length of stay and quality of care among inpatients with myocardial infarction. Am J Med. 2002 Sep;113(4):288-93.

The authors studied whether transfer of care when house staff and faculty switch services affects length of stay or quality of care among hospitalized patients. The authors performed a retrospective analysis in 976 consecutive patients admitted with myocardial infarction from 1995 to 1998. Patients who were admitted within 3 days of change in staff were denoted end-of-month patients. Of 782 eligible patients, 690 (88%) were admitted midmonth and 92 (12%) at the end of the month. The median length of stay was 7 days for midmonth and 8 days for end-of-month patients ($P = 0.06$). End-of-month admission was an independent predictor of length of stay in

multivariate models. In addition, a significant difference in length of stay was noted between patients admitted at the beginning and end of the academic year. There were no statistically significant differences in the use of aspirin, beta-blockers, angiotensin-converting enzyme inhibitors, or lipid-lowering agents at discharge between midmonth and end-of-month patients. Mortality and in-hospital adverse events did not differ between the two groups, with the possible exception of a greater incidence of acute renal failure in the end-of-month patients. Although admission during the last 3 days of the month is an independent predictor of length of stay, it does not have a large effect on quality of care among patients with myocardial infarction.

Young GJ, Charns MP, Desai K, Khuri SF, Forbes MG, Henderson W, Daley J. Patterns of coordination and clinical outcomes: a study of surgical services. Health Serv Res. 1998 Dec;33(5 Pt 1):1211-36.

To test the hypothesis that surgical services combining relatively high levels of feedback and programming approaches to the coordination of surgical staff would have better quality of care than surgical services using low levels of both coordination approaches as well as those surgical service using low levels of either coordination approach, a study sample of 44 academically affiliated surgical services that are part of the Department of Veterans Affairs were studied. In a cross-sectional analysis, surgical services were assigned to one of three groups based on their scores on feedback and programming coordination measures: high on both measures; high on one measure, low on the other; and low on both. Univariate and multivariate analyses were used to assess differences among these groups with respect to three quality indicators: risk-adjusted mortality, risk-adjusted morbidity, and staff perceptions of quality. Risk-adjusted mortality and morbidity came from an outcomes reporting program within the Department of Veterans Affairs that entails the prospective collection of clinical data from patient charts. Data on coordination practices and perceived quality came from a survey of surgical staff at each of the 44 participating surgical services. The group of surgical services using high feedback and high programming had the best perceived quality. This group also had the lowest morbidity, but the difference was statistically significant with respect to only one of the two other groups: the group with low feedback and low programming. No significant group differences were found for mortality. Study results provide partial support for the hypothesis that high levels of feedback and programming should be combined for optimal quality of care. Study results also suggest that staff coordination is more important for improving morbidity than mortality in surgical services.

Young GJ, Charns MP, Daley J, Forbes MG, Henderson W, Khuri SF. Best practices for managing surgical services: the role of coordination. Health Care Manage Rev. 1997 Fall;22(4):72-81.

Growing evidence exists that patient outcomes are related to how effectively health care organizations coordinate work responsibilities among their staffs. However, information is lacking on actual practices that can be used to achieve effective coordination. This article reports on a National Veterans Affairs Surgical Risk Study, in which the authors studied the coordination practices of 20 surgical services that, based on risk-adjusted mortality and morbidity rates, occupied different ends of the patient outcomes continuum.

Surveys about Safety and Effectiveness of the Hand-off

Apker J, Mallak LA, Gibson SC. Communicating in the "gray zone": perceptions about emergency physician hospitalist handoffs and patient safety. Acad Emerg Med. 2007 Oct;14(10):884-94.

To identify the perceptions of emergency physicians (EPs) and hospitalists regarding interservice handoff communication as patients are transferred from the emergency department to the inpatient setting, investigators conducted individual interviews with 12 physicians (six EPs and six hospitalists). Data evaluation consisted of using the steps of constant comparative, thematic

analysis. Physicians perceived handoff communication as a gray zone characterized by ambiguity about patients' conditions and treatment.

Two major themes emerged regarding the handoff gray zone. The first theme, poor communication practices and conflicting communication expectations, presented barriers that exacerbated physicians' information ambiguity. Specifically, handoffs consisting of insufficient information, incomplete data, omissions, and faulty information flow exacerbated gray zone problems and may negatively affect patient outcomes. EPs and hospitalists had different expectations about handoffs, and those expectations influenced their interactions in ways that may result in communication breakdowns. The second theme illustrated how poor handoff communication contributes to boarding-related patient safety threats for boarders and emergency department patients alike. Those interviewed talked about the systemic failures that lead to patient boarding and how poor handoffs exacerbated system flaws. Handoff between EPs and hospitalists both reflect and contribute to the ambiguity inherent in emergency medicine. Poor handoffs, consisting of faulty communication behaviors and conflicting expectations for information, contribute to patient boarding conditions that can pose safety threats. Pragmatic conclusions are drawn regarding physician-physician communication in patient transfers, and recommendations are offered for medical education.

McCann L, McHardy K, Child S. Passing the buck: clinical handovers at a tertiary hospital. N Z Med J. 2007 Oct 26;120(1264):U2778.

The authors surveyed house officers and nurses regarding timing, structure and content of clinical handover and compare these results. Secondary aims included the development of an 'on-call' sheet and the development of guidelines for handovers from the results collated. Sixty house officers (post graduate years 1-3) and sixty nurses working at Auckland City Hospital were asked to complete a survey covering various aspects of clinical handover in their current department. This study showed that nurses have more handovers than house officers in a 24-hour period. Nurses had an average of 3.2 handovers compared with the 1.2 handovers reported by house officers. Nurses rated their handovers as 'good', with a mean score of 7.8/10, while house officers rated the standard of their handovers as only 'average', with a mean score of 5.1/10. This was noted to be a statistically significant difference with a p-value of 0.01. The study found that 60.9% of house officers reported that they had encountered a problem at least seven times in their most recent clinical rotation that they could directly attribute to a poor handover. However, nurses reported a much lower incidence of problems relating to poor handover standards, with 37.5% of this group indicating that they had experienced a clinical problem with a patient related to a nursing handover.

The study identified that health professionals perceive that clinical problems can be attributed to poor clinical handover. The majority of respondents in the study felt that an effective handover system should include a set location for handover, a standardized 'on-call' sheet and training related to handovers.

Ye K, McD Taylor D, Knott JC, Dent A, MacBean CE. Handover in the emergency department: deficiencies and adverse effects. Emerg Med Australas. 2007 Oct;19(5):433-41.

To determine problems resulting from ED handover, deficiencies in current procedures and whether patient care or ED processes are adversely affected. A prospective observational study at three large metropolitan ED comprising three components: observation of handover sessions, 2 h post-handover surveys of the receiving doctors and a general survey of ED doctors.

The handovers of 914 patients were observed during 60 handover sessions in a 3-month period. Medical information, including presenting complaints, was handed over better than communication and disposition information. Seven hundred and seven (77.4%) of 914 potential post-handover interviews were undertaken. Most (88.3%) doctors thought the handover was 'adequate/good'. However, information was perceived as lacking in 109 (15.4%) handovers, especially details of management (35, 5.0%), investigations (33, 4.7%) and disposition (33,

4.7%). There was a significant difference in the perceived quality of handovers (1-5 scale where 5 = excellent) when all required information was handed over and when it was not (median scores 4.0 vs 3.0, respectively, $P < 0.001$). As a result of perceived inadequate handovers, the doctor/ED and patient were affected adversely in 62 (8.8%) and 33 (4.7%) cases, respectively, for example, repetition of assessment, delays in disposition and care. Fifty doctors completed the general survey. Most believed communications made to inpatient units, inaccurate/incomplete information and disorganization were problematic.

Deficiencies in handover processes exist, especially in communication and disposition information. These affect doctors, the ED and patients adversely. Recommendations for improvement include guideline development to standardize handover processes, the greater use of information technology facilities, ongoing feedback to staff, and quality assurance and education activities.

Talbot R, Bleetman A. Retention of information by emergency department staff at ambulance handover: do standardized approaches work? *Emerg Med J.* 2007 Aug;24(8):539-42.

Ambulance crews usually have just one opportunity to convey information about their patients to emergency department (ED) personnel. ED staff receiving patients from ambulance crews will naturally be focused on their own initial assessment of the patient, which often distracts them from listening carefully to the ambulance crew's handover. Important information may be lost after the ambulance crew leaves. Current handover practice was evaluated in two large EDs. A structured DeMIST format for verbal handover of pre-hospital information from the ambulance crew to receiving ED staff was then introduced into one of the departments. The number of packets of information in each verbal handover and the accuracy of ED staff's recall was assessed. 56.6% of the information given at verbal handover by the ambulance crews was accurately retained by ED staff before the introduction of DeMIST. Only 49.2% of the information given at verbal handover by the ambulance crews in the DeMIST format was accurately retained by ED staff. Communications training, clinical team leadership and team discipline must support the communication process between ambulance crews and the ED team to ensure that important pre-hospital information is not lost or misinterpreted. Electronic patient report forms are currently under development and may provide a partial solution for the transfer of accurate pre-hospital information to ED staff.

Jenkin A, Abelson-Mitchell N, Cooper S. Patient handover: time for a change? *Accid Emerg Nurs.* 2007 Jul;15(3):141-7.

Receiving a patient handover from an ambulance crew occurs many times during the day across the country. Handover has major implications for subsequent patient care but there has been little investigation of the handover process between ambulance and emergency department staff. Four emergency departments and one ambulance service were included within one geographical area in the UK. The research was based on a quantitative approach using a descriptive, non-experimental cross-sectional survey. A questionnaire was distributed to a convenience sample of ambulance paramedics and emergency department nurses and doctors. The questionnaire was constructed using mainly closed questions with some qualitative data collected through open questions. Data was analyzed using SPSS version 11.5. Of the 101 questionnaires distributed, a total of 80 (68%) participants contributed towards the study. The results indicated emergency department staff need to appreciate that a lack of active listening skills can lead to frustration for ambulance staff. Ambulance staff must expect to repeat their handover, especially for patients in the resuscitation room. Handovers for critically ill patients should be delivered in two phases, with essential information given immediately and again thereafter to give further information when initial treatment has been undertaken. Suggestions are made for improving handovers by developing national guidelines and by incorporating handover in emergency department education.

Sabir N, Yentis SM, Holdcroft A. A national survey of obstetric anaesthetic handovers. *Anaesthesia*. 2006 Apr;61(4):376-80.

The handover of patient information between shifts enables continuity of care and increases patient safety. The authors surveyed UK practice during handovers in obstetric anaesthesia. A questionnaire was sent to 239 lead consultant obstetric anaesthetists to record routine practice in their unit and individual opinion about handover procedures. Responses were received from 168 anaesthetists, a 70% response rate. Handover policies were available in 10% of units. Most (76%) responding units had an allocated time for handover. In most units (76%), the duration of handover was reported as being < 15 min but the actual duration and depth of any discussion involved were not specified. Handovers were rarely documented in writing (7%). Consultant anaesthetists were most likely to be present at the morning handover and few handovers were multidisciplinary. Four percent of units reported critical incidents following inadequate handovers in the past 12 months. The authors identify features in handover procedures that could be improved.

Horn J, Bell MD, Moss E. Handover of responsibility for the anaesthetised patient - opinion and practice. *Anaesthesia*. 2004 Jul;59(7):658-63.

Anaesthesia is a critical and complex process that extends from the pre-operative assessment through to the postoperative management of patients. Handover of responsibility for logistical as opposed to patient-orientated reasons may compromise that process of care. If such handover becomes inevitable with shift-based patterns of working, the implications need to be considered and procedures developed in order to minimize adverse consequences. This survey of national practice reveals little formalization of procedure and a spectrum of opinion on the relevance of the key considerations. There is, however, a majority view amongst respondents that national guidelines would be of value and that professional defensibility would be aided by standardization and documentation of any handover.

Theorem S, Morrison W. A survey of the perceived quality of patient handover by ambulance staff in the resuscitation room. *Emerg Med J*. 2001 Jul;18(4):293-6.

The aim of this study was to examine the quality of handover of patients in the resuscitation room by describing the current perceptions of medical and ambulance staff. This was a descriptive survey using two anonymous questionnaires to gauge current opinion, one designed for medical staff and the other for ambulance staff. Questionnaires were distributed to medical staff in two teaching hospital accident and emergency (A&E) departments and ambulance personnel in the Tayside region of Scotland. 30 medical and 67 ambulance staff completed questionnaires. Some 19.4% of ambulance staff received formal training in giving a handover, 83% of the remaining felt there was a need for training. Medical staff conveyed their belief that handovers were very variable between crews and that they did not feel radio reports were well structured. Ambulance crews felt that medical staff did not pay attention to their handovers. Ambulance staff seemed satisfied with the quality of their handovers, although medical staff were less positive particularly in the context of self poisoning and chest pain. Both seem to be least confident with regards to the handover of paediatric emergencies. Medical staff were generally less satisfied with the reporting of vital signs than the history provided. Despite a generally positive perception of handovers there may be some room for improvement, in particular in the area of medical emergencies. Ambulance staff training should produce a structure for the handover that is recognizable to medical staff. The aim being a smooth and efficient transfer from prehospital agencies to A&E staff.

Roughton VJ, Severs MP. The junior doctor handover: current practices and future expectations. *J R Coll Physicians Lond*. 1996 May-Jun;30(3):213-4.

Restructuring junior doctors' patterns of work has led to several changes, including the increasing implementation of shift and partial-shift rotas. These changes heighten the necessity for good communication between the doctors responsible at different times for the patients. The authors sent a questionnaire to all junior doctors in two district general hospitals; the results showed that

existing handover systems are frequently not as good as doctors would wish. In the authors' opinion, the lack of advice and guidance on the structure of handover has impeded good practice, and a standard of professional practice needs to be set. Opportunities exist within the NHS to utilize information systems to obtain the necessary information and to improve the format of the handover.