The Nature of Turbulence and Workload:
Conceptual and Operational Clarification

Jennifer Browne, MSN, RN-BC, CCRN
Carrie Jo Braden, PhD, RN, FAAN

Problem Statement: Accurate measures of nursing work are essential for determining staffing recommendations. In our informatics community there is interest in measuring workload by using health information technology (HIT) applications, but experts caution "staffing decisions that lack consideration of all relevant factors may result in poor patient outcomes". This research contributes to nursing informatics science by differentiating between workload and turbulence and developing a preliminary turbulence variable measure. Increased workload is correlated with poorer patient outcomes. The term workload is found extensively in nursing research, yet definitions are rarely provided. Although workload quantifies nursing care, it still provides an incomplete picture of work activities. Measurement also varies; bed ratios, turnover, midnight census, task, acuity and patient classifications are examples of measures used as proxies for workload. Turbulence describes disruptive forces that intrude on the nurses' ability to practice. Jennings characterized turbulence as loss of control due to simultaneous demands; unfamiliar work; heavy workloads; and excessive responsibility. The attributes explicated by Jennings clustered into communication and workload themes. Turbulence characteristics exclusive to communication are: breakdowns, distractions, interruptions, loss of information, cognitive stacking and impaired decision-making. Related concepts can share attributes, but it is important to distinguish between them. Combining turbulence and workload characteristics clouds an understanding of both concepts. Unfortunately, this type of conceptual clarity problem has plagued nursing science, where theoretical inconsistency, vague terminology and ambiguity impede scientific advancement. **Methods:** A fifteen item turbulence measure was developed from the literature and pilot tested. Turbulence items were then administered as part of a national survey investigating a Health Information Technology Workaround model. The voluntary survey was sent to members of The American Association of Critical Care Nurses (AACN). **Results:** AACN members (n=307) responded to the email survey consisting of items measuring nurse characteristics, workload, HIT problems, workarounds and open-ended questions. Over half the respondents reported sudden acuity changes, interruptions and distractions. Other frequently selected items included administrative demands, communication breakdowns, information overload, and noise. Reliability of the turbulence scale was acceptable (a =.751, n=15). Exploratory factor analysis identified the factor structure of the turbulence variable. All but one item had primary loadings over 5, resulting in a 14 item factor solution. The items that were shared between turbulence and workload loaded together. The turbulence solution in the rotated component matrix appears to represent 5 factors and explained 54% of the variance: attention diversion, resource inadequacy, communication breakdowns, ADT and interpersonal relationships. **Significance:** By segregating workload and turbulence nursing work relationships can be explored. For example, in the primary study turbulence, not workload, was most strongly correlated with safety hazards (r = .41, N= 293, p= .000). The weakest association was between workload and safety hazards (r = .16, N= 293, p= .005). This is important because workload issues are difficult to intervene upon, but turbulence problems can often be remedied. These findings suggest that turbulence is a measurable characteristic and, in context, can contribute to a clearer understanding of nurse work.