Positive Deviance

An Elegant Solution to a Complex Problem

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As systems evolve over time, their natural tendency is to become increasingly more complex. Studies in the field of complex systems have generated new perspectives on management in social organizations such as hospitals. Much of this research appears as a natural extension of the cross-disciplinary field of systems theory. This is the 13th in a series of articles applying complex systems science to the traditional management concepts of planning, organizing, directing, coordinating, and controlling. This article provides one example of how concepts taken from complex systems theory can be applied to real-world problems facing nurses today.

In the February issue of this column, Dr. Clancy introduced the concept of positive deviance (PD) as a means to engage nurses in improving clinical and administrative performance outcomes in health systems. This article is coauthored with Dr. Lindberg who, with a team of researchers, recently completed a study funded by The Robert Wood Johnson Foundation, on the use of PD to reduce the incidence of methicillin-resistant *Staphylococcus aureus* (MRSA) in hospitals. Dr. Lindberg is an expert in the field of complex systems and recently co-edited the book, *On the Edge: Nursing in the Age of Complexity*, which focuses on theoretical and practical applications of complexity theory in nursing systems.

Who Works With Whom on MRSA Infections Pre-PD?

In Figure 1, what patterns strike you in this social network map of relationships among staff on 4 hospital nursing units? This social network map is an outcome of a simple, conventional model of change. Plans, policies, and education initiatives are developed by a few experts and rolled out through the hierarchy, whose members in this map are the hubs, or nursing managers, shown in the middle of each unit cluster. Data for the social network map were gathered by a confidential survey that asked staff to identify persons with whom they work on (MRSA) prevention.

As you ask yourself how these patterns could relate to rising healthcare-associated infections (HAIs), one of today’s most vexing patient safety challenges. Consider some factors associated with this problem within the context of relationships in healthcare organizations:

- where long-standing patterns of behavior, like hand hygiene, are maintained by everyday actions and inactions of staff;
- where the behaviors of many staff members and patients affect transmissions;
- where some powerful professionals do not practice safely;
- where healthcare providers confront a virulent and adaptable foe—bacteria that move in invisible networks and are increasingly resistant to antibiotics; and
- where there exists a common myth that HAIs are an unfortunate and unavoidable consequence of modern medicine.

**Conventional Methods Under Siege**

This belief in the inevitability of infections is not surprising. Many
healthcare leaders have worked diligently to reduce HAI rates. Experts such as infection preventionists, hospital epidemiologists, nursing leaders, and quality improvement staff have crafted and rolled out detailed prevention plans. New policies based on the latest evidence-based practices have been put in place and served as the basis for extensive staff education. Aggressive hand-hygiene campaigns have been instituted. Data on compliance with key infection prevention practices have been gathered and shared with staff. Widely accepted quality improvement techniques have been used.

Despite these efforts, HAI rates continue to rise, or perhaps drop briefly in some organizations and then resume their upward march. This leads to frustration and determination to try harder and refine the implementation plans. Some leaders, however, have begun to wonder whether the very assumptions underlying traditional improvement and change strategies are incomplete or flawed. Perhaps change is not something that can be controlled. Perhaps expert plans cannot be relied on to produce intended results. Perhaps it is not possible to reliably predict how staff will react to new instructions and educational initiatives. Perhaps best practices alone are not the answer. Perhaps, perhaps.

These leaders have come to believe that healthcare organizations are not machinelike, not predictable. Instead of a change in one part, say a policy, producing the intended effect, something surprising emerges, like no change. Among these thoughtful healthcare leaders are a few who, drawing on their experience and insights from the new science of complexity, have come to understand their organizations as complex systems. They realize important quality outcomes like infection rates are the result of self-organizing processes that cannot be controlled. They have drawn their inspiration from new nursing research on quality,\textsuperscript{2,3} journal articles about the importance of relationships and conversations in quality improvement interventions.\textsuperscript{4,5} These new leaders who have explored complexity science concepts have come to believe quality outcomes such as HAI rates can be influenced by attending to parameters that shape self-organization. These include:

- number and nature of relationships in an organization,
- difference and diversity in perspective and action,
- extent to which power is centralized or shared, and
- degree to which variability and experimentation coexist with order and standardization.

A small group of these leaders—nurse leaders, patient safety officials, physicians, and healthcare administrators—became intrigued by PD because they saw in this process a potentially effective means of affecting these parameters. They came from 8 hospitals in North and South America and joined with Plexus Institute, Positive Deviance Initiative, and Centers for Disease Control and Prevention (CDC) to combat MRSA. Together they formed the PD MRSA Prevention Partnership.\textsuperscript{6}

**Positive Deviance and Complexity**

Positive deviance was created 20 years ago as a behavioral change process to deal with health-related challenges in the developing world such as childhood malnutrition, HIV/AIDS prevention, and maternal and neonatal mortality.\textsuperscript{7} The process is predicated on the belief

![Figure 1. Social network map: who works with whom on methicillin-resistant Staphylococcus aureus infections pre-PD?](image-url)
that, in most organizations and communities, there are individuals and groups whose different (deviant) practices or strategies produce better (positive) outcomes than do colleagues who have access to the same resources. The PD process helps members of the community uncover the positive deviants in their midst and identify their successful practices and then, through widespread engagement, amplify and spread these practices. It acknowledges that expertise is widely distributed and that those on the frontline have a keen sense for what is working, what can work, and for the barriers that inhibit safe practice. One of the mantras of PD is: “Who else needs to be here?” The broad participation PD elicits and the multiple conversations it generates also lead to the creation of new PD practices, which, because they emerge from within the organization, are more likely to diffuse widely and be sustained (Table 1).

Evidence of the widespread engagement and new staff relationships fostered by the PD process can been seen in a second social network map, generated by the same question—“With whom are you working with now on MRSA prevention”—asked of staff from the same 4 units that generated the first map 18 months earlier.

Who Works With Whom on MRSA Infections Post-PD?

Figure 2 shows a new pattern of participation and connection that illustrates increased communication and collaboration among diverse individuals and groups working in different roles and in different units, developed in tandem with new norms for infection prevention, such as consistently vigilant hand hygiene, and fewer infections among patients. The larger and more complex network was an emergent outcome of a self-organizing process informed by PD and which no individuals or leaders controlled.

![Figure 2. Social network map: who works with whom on methicillin-resistant Staphylococcus aureus infections post-PD?](image)

### Table 1. Consonance Between Complexity Science Concepts and Positive Deviance (PD) Process

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<tr>
<th>Complexity Science Concept</th>
<th>PD Process</th>
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<tr>
<td>• Number and nature of relationships</td>
<td>• PD seeks to involve all whose behavior affects the problem and relies on facilitators who are skilled at nurturing open conversation and encouraging participation in small group conversation.</td>
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<tr>
<td>• Difference and diversity in perspective and action</td>
<td>• PD seeks out those practicing differently and more effectively. PD engages “unusual suspects.” For example, in infection prevention, environmental service workers, unit secretaries and transporters are invited to contribute their expertise and insights.</td>
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<td>• Extent to which power is centralized or shared</td>
<td>• Leaders make it possible for frontline staff to participate actively and decide what they want to change or try on their units. They also respond promptly when staff identifies system barriers to good infection prevention practice. The goal is for staff to “own” the process, the problem, and the solutions.</td>
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<td>• Degree to which variability and order coexist</td>
<td>• PD provides the structure, the process itself, and room for experiments and changes in plans that emerge from widespread staff engagement. This requires that those who hold expert roles and management positions learn to tolerate the uncertainty and “messiness” of the process.</td>
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**Encouraging Results**

Statistics from the partnership hospitals using the innovative PD intervention documented dramatic declines in MRSA infection rates. From 2005, the year before the intervention began, through 2008, MRSA infection rates dropped 83% in 1 hospital and 59% and 60% in 2 others. In addition, the CDC determined in an analysis of microbiology data from several hospitals that antibiotic resistance of *S. aureus* had declined.\(^8\) The decrease in antimicrobial resistance, which dislodges the myth that nothing can be done to fight superbugs, is another surprising result of self-organization and interaction, this time between social and bacterial networks. A nurse at Albert Einstein Medical Center, Philadelphia, captured what the work meant to her and her colleagues: “This means patients did not die or suffer from infections we gave them, that patients were able to leave the hospital healthier and get back to their families sooner.” And it means HAIs can be prevented.

**REFERENCES**