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LITERATURE REVIEW SERIES**

**FACTORS SUPPORTING HIGH
PERFORMANCE IN HEALTH CARE
ORGANISATIONS**

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TURNING EVIDENCE INTO ACTION

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Foreword

This review was commissioned by the National Institute of Clinical Studies (NICS) following the observation that, despite an apparent commitment to best practice by clinicians from all participating sites, data emerging from the NICS Emergency Department Collaborative suggest that hospitals vary in their capacity to implement change.

It is assumed that there must be some enabling features at a system level that characterise those hospitals that were better able to implement change.

The aim of this review is to understand what it is about organisations that are able to deliver quality care, and whether there are strategies for changing an organisation's culture and procedures in ways that make it more responsive to the needs of its clinicians to implement evidence-based best practice.

Executive Summary

A review of the literature on factors associated with high performance in health care organisations and other industries was completed, with a focus on the literature from 1995 to the present. For the purposes of the study, performance included organisational clinical performance (i.e. performance in care delivery), organisational change and innovation, productivity, market share and financial performance, team and individual job performance.

The literature suggested complex interactive relationships among the factors that influence performance - relationships that have not been confirmed or clearly specified. There appeared to be a large number of factors that operated at different phases, at different levels in the organisation and in different combinations to influence performance. Based on the results of the literature review, we identified prerequisites, enablers and drivers, as follows:

Prerequisites

- Goal setting and feedback
- Leadership
- Human resource management.

Enablers

- Climate and culture
- Structure

Drivers

- Organisational learning and knowledge transfer
- Quality management
- Training and development

Performance is dependent on will, focus and capability; yet organisations typically overdevelop capability, under-develop focus and do not develop will at all (Smith and Sharma 2002). Consideration of the prerequisites, enablers and drivers of performance in health care organisations should assist practitioners to ensure a better balance of capability, focus and will.

Introduction

Previous research has shown that hospitals and other health care organisations vary in their capacity to implement change designed to improve performance. It is assumed that there are enabling factors that characterise those organisations that are more successful at improving performance. The aim of this review is to understand what it is about organisations that are able to deliver quality care and whether there are strategies for changing an organisation's culture, structure and procedures in ways that make it more responsive to the needs of its clinicians to implement evidence-based best practice. Although the ultimate focus is on improving the performance of health care organisations, the review has necessarily included literature about high performance in other industries, due to the relatively limited amount of available research on healthcare management.

Conceptual Framework

We derived a matrix framework based on five types of performance relevant to the question and eight key factors that had been linked to organisational performance. From our reading of the literature, we formed the view that there are 5 major relevant types of performance:

- organisational clinical performance
- organisational change and innovation performance
- organisational productivity, market share and financial performance
- team performance
- individual job performance.

To ensure a comprehensive approach to the review of the literature, we initially used the Peters and Waterman's 7S Framework as an organising categorisation. This enabled us to focus the literature search on a comprehensive set of organisational factors (Strategy, Structure, Systems, Style, Staff, Skills and Shared values) that might support or enable performance.

A number of more detailed themes emerged from our analysis, and we amended the categorisation to reflect these key areas. The tables that accompany this text summarise the literature in relation to the impact of 8 factors on the 6 types of performance. The eight factors are Leadership, Goal Setting and Feedback, Climate and Culture, Systems and Processes (which includes Human Resource Management), Strategy, Training and

Development (which includes staff competencies and characteristics), Structure, including teamwork, and Quality Management, CQI and TQM.

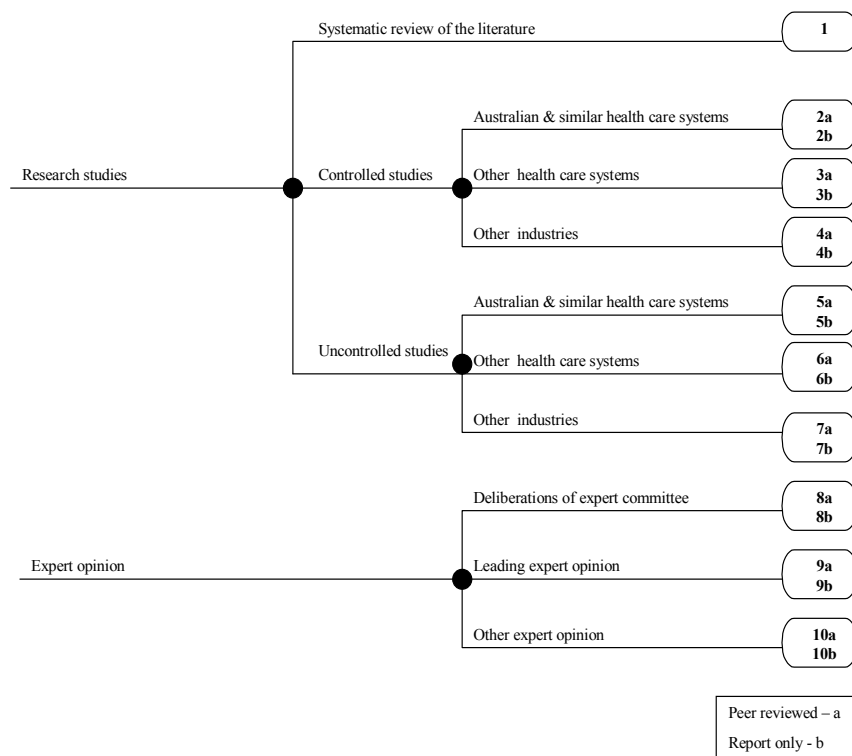
Not all of these factors were found to be important for the purposes of improving performance in health care organisations. For example, human resource management appeared to be the most important aspect of the literature detailed in the Systems and Processes table, and while we summarised the small literature related to Strategy, there was little that was found to be directly applicable to the context of performance in public sector health care organisations. In the end, eight different factors were found to be most relevant:

- Goal Setting and Feedback
- Leadership
- Human Resource Management
- Climate and Culture
- Structure
- Organisational Learning and Knowledge Transfer
- Quality Management
- Training and Development.

Methodology

Levels of Evidence

The following framework was used to assign a level of evidence to the studies reviewed.



Identification of Articles on Characteristics of High Performing Organisations

A systematic literature review was conducted using standard literature search techniques for the years 1995 to 2003. Online computer searches of relevant computerised bibliographic databases were completed, using the key words “change management, clinical outcomes, clinical governance, communication, creativity, culture, innovation, inter-professional collaboration, knowledge transfer, organisational behaviour, organisational development, patient expectations, performance, process improvement, quality improvement, success factors, teams and teamwork”. The databases searched included: MEDLINE, PsychInfo, Expanded Academic ASAP, Emerald, and Web of Science.

These computer searches were supplemented by ancestry and dependency approach searches and manual examination of relevant journals (Academy of Management Journal, European Journal of Innovation Management, Health care Management Review, Health Services Research, Journal of Healthcare Management, Journal of Managerial Psychology, and Journal of Organization Behavior).

Assessing the factors of high performance in health care organisations through a literature search is problematic for several reasons:

1. Operationalising the concept of performance is difficult in health care organisations (Borrill, Carletta et al. 2002), and outcomes are rarely measured in a consistent, reliable and valid fashion (Jackson, Gater et al. 1993).
2. It is not always possible to rule out alternative explanations for findings as randomised controlled trials are extremely difficult to design for this area of study (Shortell, Bennett et al. 1998).
3. It is difficult to be sure that results can be generalised. The vast majority of the studies in this area have not used random sampling procedures, with sampling constructed for convenience and data availability. Different samples may generate different results and findings can only be generalised to the sampling frame adopted in the study (Short, Ketchen et al. 2002).

Findings

The literature suggests complex interactive relationships among the factors that influence high performance - relationships that have not been confirmed or clearly specified. There appear to be a large number of factors that operate at different phases, at different levels in the organisation and in different combinations to influence performance. Based on the results of the literature review, we have classified the identified factors as prerequisites (management actions that set the direction for the performance effort that follows), enablers (those attributes that support or strengthen efforts to improve performance), or drivers (those activities that directly improve performance). The factors in each category are discussed below.

Prerequisites

Goal Setting and Feedback

There is a long history of goal-setting and feedback research in the management literature. In general, setting goals and receiving feedback in relation to achievement of the goals has been associated with improved performance for organisations, teams and individuals (Locke and Latham 1990). Various forms of feedback have been associated with improved performance,

including performance measures (Scanlon, Darby et al. 2001), benchmarking (Mann, Samson et al. 1998), information on clinical outcomes (Holman, Allman et al. 2001; Merlani, Garnerin et al. 2001; National Coalition on Health Care and Institute for Healthcare Improvement 2002) and performance appraisal (West, Borrill et al. 2002). In a meta-analysis of a related theme of research, the Pygmalion effect, where people act in accordance with communicated expectations, has also been shown to exist for both individuals and groups (Kierein and Gold 2000).

The literature suggests the following goal-setting and feedback factors are enablers of higher performance:

- Participation or self-setting of goals (Durham, Knight et al. 1997; Sue-Chan and Ong 2002)
- Setting both shorter-term and long-term goals (Latham and Seijts 1999; Weldon and Yun 2000)
- Setting difficult goals, as long as the requisite ability and task familiarisation are available (Knight, Durham et al. 2001)
- Providing process feedback (Lam and Schaubroeck 1999).

Summary: There is strong evidence that individual, group and organisational goal setting with requisite feedback on performance in the achievement of the identified goals is an important factor for high organisational performance.

Leadership

The impact of leadership on performance has received substantial study, but the nature of leadership makes it very difficult to conduct randomised controlled experiments in the field. Many qualitative studies have identified correlation between leadership style and successful organisational change, innovation and operating performance, but there is limited agreement on the leadership style that is most effective, perhaps reinforcing a contingency viewpoint. For example, a literature review of the topic concluded that transformational leadership was positively associated with work unit effectiveness (Lowe, Kroeck et al. 1996). In contrast charismatic leadership, interacting with uncertainty was found to be the key predictor of performance (Waldman, Ramirez et al. 2001) and consultative, participative leadership behaviour was positively associated with higher organisational commitment, job satisfaction and performance (Yousef 2000). In the one area of consistency, little association has been found between performance and transactional leadership (Lowe, Kroeck et al. 1996; Waldman, Ramirez et al. 2001).

Key leadership characteristics and qualities associated with performance in the literature include:

- Creating a climate of psychological safety, defined as the belief that interpersonal risk taking is safe (Edmondson 1999; Edmondson, Bohmer et al. 2001).
- Articulating and communicating a vision (Weiner, Shortell et al. 1997; Young 2000)
- Enhancing organisational and employee adaptability to change (Parry 1999)
- Articulating a vision, providing an appropriate model, providing individualised support and setting high performance expectations (Sparks and Schenk 2001)

The leadership characteristics associated with high performing organisations were largely consistent with the climate and culture and team factors (see below). For example, the factors associated with a team climate for innovation included vision, participative safety, task orientation, and support for innovation (Anderson and West 1998) - all factors identified for effective leadership.

Summary: The contribution that organisational leaders make to organisational climate, culture and team working suggested that effective leadership is an important prerequisite

Human Resource Management

Although not specifically validated in health care organisations, cross-sectional studies in other industries have suggested an association between high involvement, progressive human resources (HR) practices and organisational performance (Delaney and Huselid 1996; Youndt, Snell et al. 1996; Guthrie 2001; Barraud-Didier and Guerrero 2002). Koys used cross-lagged regression analysis to demonstrate that HR outcomes (such as employee satisfaction, organisational citizenship behaviour and turnover) influence business outcomes, adding to the evidence of a causal relationship between HRM and organisational performance (Koys 2001). Within health care organisations effective HR practices of appraisal and sophisticated training policies were associated with lower patient mortality (West, Borrill et al. 2002).

HR policies and practices that address employee needs were also associated with higher organisational performance. In particular, work-family human resource policies (Perry-Smith and Blum 2000), organisational support for staff (Randall, Cropanzano et al. 1999), and organisational commitment to employee well-being (Lee and Miller 1999), including congruence with employee work status (shift-work) requests (Holtom, Lee et al. 2002) were positively associated with organisational performance.

In general, the HRM practices found to be positively associated with organisational performance include employee participation and empowerment, team work, employee training and performance-contingent incentive compensation (Delaney and Huselid 1996).

Summary: Health care organisations planning to improve performance, including organisational change and innovation performance, in the first instance require relevant human resource practices that build on goal setting and feedback (such as performance appraisal and reward and recognition) that are supported by effective leadership.

Enablers

Climate and Culture

The effect of organisational climate and culture on performance has received substantial study. Organisational climate has been defined as individual sense-making of the work environment (Ashforth 1985) or alternatively, as the shared perceptions of employees in an organisational unit (Anderson and West 1998). Organisational culture tends to be defined as the normative beliefs and shared behavioural expectations of the employees in an organisational unit (Cooke and Szumal 1993; Glisson and James 2002). Although still the subject of some debate, a distinction is that climate belongs to the individual, while culture is the property of the organisation (Glisson and James 2002). In reality, the two constructs have not been consistently defined, applied or distinguished in the studies we reviewed.

Although not unequivocally supported through controlled experimental design, cross-sectional and case studies suggested a non-punitive organisational climate, with a participative team-based culture in which members have developed sufficient trust and psychological safety to constructively question behaviours and discuss mistakes openly, was positively associated with clinical and organisational performance and innovation. This was found in studies of acute care (National Coalition on Health Care and Institute for Healthcare Improvement 2002), implementation of new clinical procedures in an operating theatre (Edmondson, Bohmer et al. 2001), in relation to adoption of clinical guidelines (Merlani, Garnerin et al. 2001), and within a nursing home (Yeatts and Seward 2000). These aspects of culture and climate are discussed in more detail below.

Non-punitive climate, participation, trust and psychological safety

Consultative, participative leadership behaviour was positively associated with organisational commitment, job satisfaction and self-appraised performance (Yousef 2000). The more employees feel that they participate in decision-making, the more they feel supported by their immediate supervisor, which is accompanied by exhibiting more organisational citizenship behaviours (VanYperen, van den Berg et al. 1999). Organisational citizenship represents the

actions of employees outside of their formal job role that improve the functioning of the organisation.

In a case study that followed the implementation of balloon angioplasty in a number of different surgical teams, the teams with the greatest success had a leader who promoted psychological safety (Edmondson, Bohmer et al. 2001). A longitudinal study of business students found that all types of conflict were higher in higher performing teams (Jehn and Mannix 2001) and interpersonal conflict was found to be the best predictor of team effectiveness (Devine, Clayton et al. 1999), supporting the view that higher performance is associated with team member confidence to challenge. The concept of group psychological safety was extended to show organisational climate for psychological safety was positively associated with goal achievement and return on assets for industrial and service firms (Baer and Frese 2003).

Although not empirically tested, one would suspect a link between psychological safety and efficacy. Defined as the confidence that capabilities can be used for a course of action that will result in performance, higher levels of efficacy for individuals and teams have been associated with higher performance in a variety of industries (Bandura 1982; Wood, Bandura et al. 1990) and better quality of care in health care (Gibson 2001). Higher self-efficacy in individuals was associated with more suggestions for workplace improvement (Axtell, Holman et al. 2000). In this context, efficacy is an important construct. "If you experience fear every day, it drags you down and you become cowardly." (Ryan and Oestreich 1991).

There was evidence that these organisational climate and culture characteristics were related to successful implementation of quality management programs, such as total quality management (TQM) (Boerstler, Foster et al. 1996; Berlowitz, Young et al. 2003), and innovation and creativity at both the organisational and individual level (Anderson and West 1998; Pech 2001; Martins and Terblanche 2003). "The increased trust generated by continuous improvement approaches, although it takes time, started with slight changes that led to greater innovative ideas" (McAdam, Armstrong et al. 1998). Development of the Team Climate Inventory suggested that vision, participative safety, task orientation, support for innovation and team interaction were the important factors for a climate for team innovation (Anderson and West 1998). A study of biotechnology firms suggested that the distinction between highly innovative firms and less innovative firms related to the ability of management to create a focused community for coordinated action (Judge, Fryxell et al. 1997). The factors found to influence the development of this sense of community were similar to the climate for team innovation discussed above, but included personalised employee recognition as an important component.

There are few field studies that include randomised controls to enable discussion of causality. A longitudinal study of UK university departments suggested that effectiveness influenced organisational climate; climate did not influence effectiveness (West, Smith et al. 1998). This study found that effectiveness at Time 1 was associated with a positive climate at Time 2. An appropriate climate may result in better performance, better performance may establish a 'high performing' climate and culture, or both culture and performance may be influenced by other variables. Further controlled studies are required to provide stronger evidence that changing the climate and culture can have an impact on health care performance, although there is ongoing debate about whether culture and climate can be measured in ways that enable valid comparisons of organisations (Ahmed 1998).

In a study of product development teams, learning was influenced by cultural factors related to occupational background - specifically, occupational groups established barriers to protect their knowledge base, limiting both learning and sharing of key information (Hyland, Gieskes et al. 2001). Occupational barriers are strong between health care professional groups, resulting from differences in status, power, and educational background (West and Slater 1996; Borrill, Carletta et al. 2002), which may make it more difficult for health care organisations to realise the performance benefits of the prerequisite organisational culture and climate. A history of favourable relationships among professionals and management groups was associated with better uptake of clinical evidence (Dopson, Fitzgerald et al. 2002), suggesting that mechanisms that increase trust and participative and psychological safety among health care professionals will have an impact on performance in health care organisations.

Summary: The cross-sectional and case studies we reviewed suggested that a non-punitive, participative climate/culture in which members have developed sufficient trust and psychological safety to constructively question behaviours and discuss mistakes openly were enablers of clinical and organisational performance and innovation.

Teamwork

Health care organisations tend to be hierarchical, where relationships between doctors, nurses and other health professionals and between the various levels of nurses have typically been authoritarian in nature. This hierarchy does not facilitate a non-punitive climate or an organisational culture of participation, trust and psychological safety. For example, hierarchical nursing teams reported lower levels of information sharing (Cott 1997). Teamwork has been seen as a mechanism to encourage a more collegial working environment among health professionals (McConnell 2000; Borrill, Carletta et al. 2002).

Recent studies of teamwork in the United Kingdom National Health Service found a significant relationship between the percentage of hospital staff working in teams and reduced patient mortality (Borrill, Carletta et al. 2002; West, Borrill et al. 2002). These studies cannot establish causality, but suggest that teamwork, or factors associated with teamwork, have a positive impact on clinical performance.

Previous studies of use of teams in health care organisations have not provided definitive results, as few have used either randomised or control methods that enable generalisation. In fact a 1995 study of teamwork in primary care suggested that the total effort of the teams may be less than the individual efforts of the team members working in isolation (Field and West 1995). In addition, most of the studies on teamwork have relied on subjective measures of team performance. This is confounded by the finding that team members tend to be overly positive in their assessment of the performance of their group; and this positive performance assessment is not generally supported by objective performance measures (Paulus 2000).

Of the few randomised studies, a clinical trial suggested that when compared with care provided by a GP alone, primary care teams were able to maintain function of elderly patients with chronic diseases with fewer hospitalisations, fewer doctors visits and at lower cost (Somers, Marton et al. 2000). However, it would be difficult to separate the care processes from the team processes and the results may have been obtained as a result of the care regimes, as the team nurses and social workers provided a more comprehensive service, including home visits and regular health monitoring, that were not provided by the single GP practices.

There have been mixed results in randomised controlled trials on group performance in creativity and innovation. In some cases, groups were found to be more effective than individuals at creativity and innovation, specifically brainstorming and new product development, (Jung and Avolio 1999; Schmidt, Montoya-Weiss et al. 2001). Other studies have shown that the idea-generation output of groups is less than that of a similar number of individuals generating ideas in isolation (Paulus 2000).

Although many health care processes rely on cross-functional teamwork, and despite the positive results for teamwork found in the recent UK studies, the research on teams has not strongly demonstrated the utility of teams (Paulus 2002) nor has it provided definitive advice on what makes cross-functional teams effective (McDonough 2000). For example, in a recent study only 9 of 25 quality improvement teams were judged as successful in achieving an improvement in the process of care and/or outcomes for their patient population, despite participating in a planned intervention designed to increase effective teamwork (Irvine Doran, Baker et al. 2002). West and Slater suggested that the potential of health care teams was not

being realised because of lack of effective communication and team working practices (West and Slater 1996).

While there have been a large number of studies that have reviewed the characteristics of team success, there has been little integration to enable understanding of interrelationships among the identified factors. In addition, the literature suggests that effective teamwork is difficult to achieve (Field and West 1995). The factors associated with high clinical team performance include:

- clear objectives, high level of participation, strong commitment to quality and support of innovation (Borrill, Carletta et al. 2002)
- team problem-solving ability, functional group interactions and participation by doctors (Irvine Doran, Baker et al. 2002)
- climate of psychological safety (Edmondson 1999; Edmondson, Bohmer et al. 2001) and constructive team culture (Detert, Schroeder et al. 2000)
- high levels of respect for members, listening, members not afraid to disagree when they hold different views (Yeatts and Seward 2000)
- self-managed teams (McConnell 2000; Ross, Rink et al. 2000)
- strong leadership and high involvement of team members (Ross, Rink et al. 2000)
- team member selection & composition (including doctor participation), use of facilitators, meeting frequency, communication, team leader, hours per week on team activities, willingness to serve on team (Higgins and Routhieaux 1999)
- clear task structure, group composition, core norms, performance of members (Vinokur-Kaplan 1995)

Leadership and team climate have been seen as important factors in team performance. Team climate was found to mediate the relation between leadership and team performance for R&D teams (Pirola-Merlo, Hartel et al. 2002). In other non-health care settings, team member diversity through a balance of learning styles (Jackson 2002), the better external communication of cross-functional groups (Keller 2001), and cross-training team members (Marks, Burke et al. 2002) were associated with more effective team performance. In a high-tech company team diversity was not associated with improved quality of ideas generation, but racial diversity was associated with greater quantity of ideas generation and gender diversity was associated with lower quantity of ideas generation (Cady and Valentine 1999). In mental health care teams, team member diversity was associated with lower perceptions of

team functioning (Alexander, Lichtenstein et al. 1996). Unfortunately this study did not measure team effectiveness, with the result that there is no linkage between the members' perceptions of poorer team functioning and actual performance.

The effectiveness of team building and training activities has been debated. Despite anecdotal evidence, a meta-analysis found no support for the effectiveness of team building interventions in improving team performance, when objective performance measures were used (Salas, Mullen et al. 1999). On a more positive note, organisational implementation of CQI and TQM was found to improve the effectiveness of clinical teams (Lemieux-Charles, Murray et al. 2002).

Although further empirical study is required to confirm the characteristics of high performing health care teams, it is suggested that effective teamwork can enable high performance in health care organisations.

Summary: The literature suggested that participation, through psychological safety, and mechanisms to assist the development of effective teamwork enable higher performance.

Structure

The previous section reviewed the findings related to teamwork in relation to the team-based aspects of organisational climate and culture. In this section we address other aspects of structure found to impact organisational performance. The literature suggested that the relationship between structure and performance was contingent upon external factors. Mathematical modelling suggested a centralised organisation structure is more effective when innovation opportunities are moderate, while decentralisation is preferred when innovation opportunities are rich (Chang and Harrington 1998). This was partially supported in a study of behavioural treatment centres, with growing centres that had a decentralised structure showing better performance (Richardson, Vandenberg et al. 2002).

A case study of Canadian research organisations found a correlation between the stage of the organisational life cycle and the type of structure (Hunter 2002). At different times, different structures may be more effective. However, in general, organisations with entrepreneurial proclivity, which is positively associated with higher performance through a market orientation, also tended to have low levels of centralisation and departmentalisation (Matsuno, Mentzer et al. 2002), and specialisation, formalisation, standardisation and centralisation were found to inhibit innovation (Martins and Terblanche 2003).

Summary: Less hierarchical and centralised structures tend to be associated with entrepreneurial proclivity and higher levels of innovation. A participative team-based culture in which members have developed sufficient trust and psychological safety to constructively

question behaviours and discuss mistakes openly is identified as an enabler of high performance.

Drivers

Organisational Learning and Knowledge Transfer

The literature provided support for an association between customer focus within a learning climate (also consistent with the principles of quality management) and organisational learning (Baker and Sinkula 1999; Lipshitz and Popper 2000); and a subsequent association between organisational learning and organisational performance (Baker and Sinkula 1999). Learning orientation is a characteristic describing an organisation's ability to value knowledge-questioning behaviours. A learning orientation requires the enabling non-punitive organisational climate, with participation, trust and psychological safety that enables constructive questioning (Edmondson 1999).

A study of emergency department innovations characterised the innovation process as occurring when individuals with different interests played different roles at different times (Fernandez 2001). This is consistent with the findings of the organisational learning research in other industries (de Weerd-Nederhof, Pacitti et al. 2002). Through case studies of innovative breakthroughs, it was suggested that organisational enablers, including communication, informal networks and a structure to foster innovation were key requirements to keep the varying interests of the participating individual from diverting the innovation agenda (O'Connor and Rice 2001). In addition, the greater the interests, values and power of the participating individuals mapped to the risks and benefits of the innovation, the greater the likelihood of success (Denis, Hebert et al. 2002).

The growing literature on evidence, learning and knowledge suggested that the production and use of evidence was not solely a scientific process, but was dependent on social factors. A team of UK researchers found that diffusion of evidence was highly variable and largely dependent upon context (Dopson, Fitzgerald et al. 2002). Pfeffer and Sutton suggested that knowledge of how to enhance performance was not easily transferred within organisations (Pfeffer and Sutton 1999). Consistent with the findings in relation to climate and culture, greater use of evidence and knowledge transfer required a history of effective, quality relationships that enabled information sharing within a supportive organisational culture (Dopson, Fitzgerald et al. 2002). In addition, a recent review of learning organisations concluded that quality training could improve information transfer (Yahya and Goh 2002). This suggested that organisational learning and knowledge transfer can drive innovative performance only when the organisational prerequisites and enablers are in place.

Summary: Information and knowledge management and transfer are important to assist in improving operations within and between organisations. However the literature suggested that this driver of performance would not be effective without the necessary organisational prerequisites and enablers.

Continuous Quality Improvement, Quality Management and Total Quality Management

A large literature reviewed the impact of quality management (QM), continuous quality improvement (CQI) and total quality management (TQM) on clinical performance of health care organisations, with generally positive findings of the association (Shortell, Bennett et al. 1998; Fraser, Wilson et al. 2002; Kossovsky, Chopard et al. 2002). Similar results have been found in other industries, with implementation of a quality orientation found to influence organisational performance (Hansson and Eriksson 2002). Although the studies generally found a positive association between quality management principles and performance there were few randomised controlled trials, and even within the correlational studies the response rates were varied.

Two paths specified how the focus on quality can improve firm performance: product quality with conformance to specifications and relationship quality with superior customer responsiveness and service (Curkovic, Vickery et al. 2000). A variety of frameworks and organisational requirements were documented for successful implementation of quality initiatives (Terziovski and Dean 1998; Australian Institute for Primary Care 2001). Although the frameworks often included different requirements, the factors that were identified most often include:

- Systematic problem-solving based on data and statistical analysis (Irvine Doran, Baker et al. 2002; Lee, Choi et al. 2002), with feedback (Shortell, Bennett et al. 1998)
- Participation by doctors (Shortell, Bennett et al. 1998; Fraser, Wilson et al. 2002; Irvine Doran, Baker et al. 2002) in effective cross-functional teams (Irvine Doran, Baker et al. 2002)
- Employee involvement and empowerment (Terziovski and Dean 1998; Dow, Samson et al. 1999), including middle management involvement (Davis and Fisher 2002)
- Explicit focus on internal and external customers (Terziovski and Dean 1998; Dow, Samson et al. 1999)
- Value chain integration (Sharma and Gadenne 2002).

Despite the knowledge that doctor participation and data analysis are critical, case studies of 10 American hospitals identified the difficulties in effectively involving doctors in the implementation of TQM and the barriers to quality improvement created by the lack of adequate information systems (Boerstler, Foster et al. 1996).

Summary: The findings that a quality management perspective, through the implementation of CQI/TQM, was positively associated with organisational performance (Shortell, Bennett et al. 1998) and organisational innovation (McAdam, Armstrong et al. 1998) suggests that quality management can be used as an effective driver of organisational performance.

Training and Development

The literature suggests that despite the existence of the right prerequisites and enablers, certain individuals tended to be more resistant to change and innovation than others. For example, individuals with higher maladaptive defence mechanisms had higher resistance to change; those with higher adaptive defence mechanisms were more supportive of change (Bovey and Hede 2001). It was suggested that resistance to innovation and change is high when employees feared losing their 'investment costs' in the change. For example if employees suspected future job loss or the inability to use capital acquired through the change, they would be more resistant to the change. Many of the factors of resistance can be addressed through human resources practices, such as employment guarantees, bonus payments, and training and development (Zwick 2002). Trader-Leigh identified the following key resistance forces to change (Trader-Leigh 2002):

- Self-interest
- Psychological impact
- Tyranny of custom
- Redistributive effects
- Destabilisation effects
- Culture compatibility
- Political factors.

Major change programs in local government authorities were more successful when there was a focus on enhancing employee adaptability to change (Parry 1999). Training and development to enhance adaptability was an important driver of successful organisational change.

Increased exposure to change was related to increased acceptance of change (Axtell, Wall et al. 2002) and a relationship was found between tolerance for change and experience with

innovation over time (Savitz, Kaluzny et al. 2000). Paralysis of organisations in the face of clearly acknowledged need and incentives for change has been documented, with those responsible for leading the change unable to identify solutions or take responsibility for confronting systemic sources of obstruction (Salaman and Storey 2002). Effective training and development programs, specifically programs that increase efficacy (Pearce, Gallagher et al. 2002), improve goal setting ability (Gibson 2001) and increase exposure to change (Axtell, Wall et al. 2002), have been shown to assist as drivers in improving performance. In health care, the sophistication of organisational training policies was associated with lower levels of patient mortality in acute hospitals (West, Borrill et al. 2002).

Summary: Training and development has been shown to assist individuals and teams increase efficacy, enhance adaptability and decrease resistance to change. Training and development is often considered part of the package of high performance human resource practices. It is included as a driver, as training and development will only be successful within the broader supporting organisational prerequisites and enablers.

Conclusion

Performance is dependent on will, focus and capability; yet organisations typically overdevelop capability, under-develop focus and do not develop will at all (Smith and Sharma 2002). Consideration of the prerequisites, enablers and drivers of performance in health care organisations should assist practitioners to ensure a better balance of capability, focus and will. In the prerequisite stage goal setting and feedback addresses the focus, leadership, the will, and human resource management ensures the capability. Among the enablers, climate and culture provide the focus and the will, while structure addresses capability issues. Finally, within the drivers, organisational learning and knowledge transfer can assist in developing will, quality management provides the focus and training and development ensures the capability.

Strong causal relationships have been documented with goal setting and feedback, transformational/charismatic leadership and high-involvement human resource management practice resulting in better performance. These have been identified as the prerequisites for high performing health care organisations.

Although not confirmed through randomised controlled trials, correlational studies found an association between climate and culture, including a team-based culture, and performance. A non-punitive organisational climate, with a participative team-based culture in which members have developed sufficient trust and psychological safety to constructively question

behaviours and discuss mistakes openly, supported by a decentralised, participative structure is identified as an enabler of high performance.

Finally, the ability to transfer knowledge and information throughout the organisation, a capability in quality management and focused training and development appear to assist as drivers of high performance, provided the prerequisites and enablers are functional.

Tables

Factors Supporting High Performance In Health Care Organisations

Leadership						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
Studies on organisational clinical performance						
(Edmondson, Bohmer et al. 2001)	16 US hospitals	Uncontrolled post embedded multiple case studies	6a	Review of team process for implementation of new technique (balloon angioplasty).	Implementation success related to team leader behaviour, creating a climate of psychological safety	Importance of psychological safety
(Young 2000)	US Veterans Health Administration (VHA)	Longitudinal case study over 5 years	6a	VHA achieved a major shift in resources to outpatient and preventive care, improved the efficiency and quality of the services provided.	Change was successful because of a new leader who was well prepared to articulate a vision for the transformation, with the development of a coherent transformation plan, that facilitated a focus on the transformation goals (while faced with numerous distractions).	Setting and clearly communicating directions
(McNeese-Smith 1999)	US hospital >500 beds	Ex-post correlational	6a		Managerial motivation for power negatively correlated with nurse job satisfaction, but positively correlated with patient satisfaction. Managerial motivation for achievement positively correlated with both.	
(Weiner, Shortell et al. 1997)	US acute care community hospitals	Cross-sectional by mailed survey.	6a		Top management and board leadership associated with clinical involvement in CQI/TQM. The greater the physician at large participation in governance, the lower the likelihood of adoption of CQI/TQM.	Setting and clearly communicating directions
(Ferlie and Shortell 2001)	US health care system	Expert opinion	9a		Core properties for quality improvement: • Leadership • Organisational culture • Team/microsystem development • IT.	
Studies on organisational change and innovation performance						
(Jung and Avolio 1999)	347 US business students	Completely crossed 2X2 randomised	4a	Compared transformational and transactional leadership for groups and individuals	Asians performed best in groups with transformational leadership. Caucasians had highest quantity with groups with transactional leadership, but higher long	

Leadership						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
		controlled trial			term oriented performance with transformational leadership in groups	
(Denis, Lamothe et al. 2001)	Canadian hospitals	Case study	5a	Change tends to be cyclical with opposing pressures reconciled sequentially.	Major change in pluralistic organisations associated with unified collective leadership in which each member plays a distinctive role.	
(Murphy and Southey 2003)	Australia HR practitioners	Cross-sectional by survey	7a		Organisational leadership, networking skills, HR group climate and role of HR group most important factors related to the implementation of high performance work practices.	
(Harvey, Pettigrew et al. 2002)	US medical and medical-related research groups	Case study	7a		Five factors associated with high achievement in research groups: • Strong leadership • Recruitment and retention of talent • Strategies of related diversification • Strongly linked theory and practice • Network connectedness	
(Mohamed 2002)	150 public departments in United Arab Emirates	Cross-sectional by survey	7a		Managerial attitude, decentralisation, supervisory support, group satisfaction, diversity, exposure to management thinking and committee membership were associated with departmental innovative behaviour.	
(Pirola-Merlo, Hartel et al. 2002)	54 R&D teams from Australian organisations in agriculture, IT, defence, materials and resources	Repeated-measures	7a		Obstacles have a negative effect on team climate. Team climate mediated the relation between leadership and team performance. Strong relationship between climate and performance.	
(Borins 2000; Borins 2002)	US & Commonwealth award applications for public sector innovation	Descriptive case study	7a	In US 50% of innovation were bottom-up; 82% in Commonwealth countries.	Both top down and bottom up approaches effective in public sector innovation. Effective public sector innovator more consistent with enterprising leaders (Behn 1998) than loose cannons (deLeon and Denhardt 2000).	Politicians and senior public servants can create environment to promote or stifle innovation.

Leadership						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
(Stoker, Looise et al. 2001)	Dutch bank and steel company	Cross-sectional	7a		Lower team member burnout associated with consultative leadership. Consultative and charismatic leadership associated with commitment, job satisfaction and perceived innovation effectiveness.	
(Parry 1999)	New Zealand local councils	Grounded theory interviews	7a		Enhancing adaptability can explain social influence processes during major change incidents at local government authorities.	3 themes: • improve clarity of leadership role • resolve uncertainty • enhance adaptability of followers to change.
(Tierney 1999)	157 employee-supervisor dyads from large US company	Cross-sectional by survey	7a		Found positive significant relationships between leader-member exchange, team quality, team climate perceptions, and employee change climate.	85% response rate
(Burpitt and Bigoness 1997)	US architectural firms	Case study and cross-sectional by survey	7a	Assessment of innovation made by principals of the firm.	Significant relationship between leaders empowering behaviour and evaluations of team innovation.	
(Scott and Bruce 1994)	R&D facilities of US industrial corporations	Cross section by Interviews & surveys	7a	Identification of determinants of innovative behaviour.	Individual innovative behaviour positively related to supervisor-subordinate relationship: • leadership & support for innovation • managerial role expectations • intuitive problem solving	Setting and clearly communicating the directions.
Studies on organisational productivity, market share and financial performance						
(Lowe, Kroeck et al. 1996)	N/A	Literature review	1		Transformational leadership associated with public sector and lower level leaders. Type of effectiveness criterion (subordinate perceptions vs organisational measures) moderates relationship between leadership style and effectiveness. Transformational leadership	

Leadership						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
					positively associated with work unit effectiveness.	
(Zairi and Jarrar 2001)	464 NHS trusts	Cross-sectional by survey.	5a	Organisational Effectiveness Model of the European centre for TQM.	Identified best practices as: • Total staff involvement • Communication • Strong sense of leadership • Teamwork • Minimal bureaucracy.	
(Paglis and Green 2002)	113 managers from 2 US organisations – commercial real estate management and industrial chemical firm	Cross-sectional by survey	7a	Based on social cognitive theory, developing a model of leadership self-efficacy (LSE).	High LSE (direction-setting and gaining followers' commitment) managers are seen by direct reports as better leaders than low LSE leaders. Interaction between overcoming obstacles to change and organizational commitment (high level of organizational commitment necessary for leadership action in overcoming obstacles).	Leadership training to ensure high LSE, and mechanisms to encourage organisational commitment.
(Waldman, Ramirez et al. 2001)	US Fortune 500 companies	Uncontrolled Cross-sectional survey	7a	Survey of senior managers (2 per company). Hard financial measure of performance	Charismatic CEO leadership, interacting with uncertainty is the key variable predictor of performance – charismatic leadership style most effective with conditions of greater uncertainty. Little association between performance and transactional leadership.	Transactional leaders work within and strengthen existing structures, strategies, and cultures. Charismatic leadership based on relationship between leader and followers.
(Singh 2000)	US large national financial services company	Cross-sectional by survey	7a	Confirmed productivity and quality are distinct constructs of frontline employee (FLE) performance.	Task control and support from supervisor associated with reduced negative job attitudes. Among FLE quality is negatively associated with burnout.	30% response rate
(Flynn, Schroeder et al. 1995)	US manufacturers	Cross-sectional by survey	7a		Top management support associated with infrastructure and core quality management practices.	60% response rate
Studies on team performance						
(Durham, Knight et al.	216 US university students in 72 teams	Randomised controlled	4a		Self-managed teams implemented better tactics, with better performance than commander-led teams.	Consistent with participative goal setting effect on

Leadership						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
1997)		computerised tank battle simulation				performance
Studies on individual job performance						
(Kirkpatrick and Locke 1996)	282 US business students	Completely crossed randomised controlled experimental	4a		Vision and vision implementation resulted in better performance. There was no effect for charismatic communication on performance.	
(Antony and Banuelas 2002)	UK firms with more than 1,000 employees	Cross-sectional by mailed survey	7a	How Six Sigma organisations prioritise CSFs for implementation identified in literature.	Management commitment and involvement was found to be most important factor for implementation of quality assurance programs.	15% response rate, only 16 companies were applying principles of Six Sigma. Setting and clearly communicating the directions
(Sparks and Schenk 2001)	US multilevel marketing organisation	Cross-sectional by survey	7a		Leadership, (with articulating a vision, providing an appropriate model, providing individualised support and setting high performance expectations) is associated with greater effort, performance and satisfaction among subordinates through transformation of followers to see 'higher purposes in their work'.	39% response rate, all females. Relationship between leader and followers is key.
(Griffin, Patterson et al. 2001)	48 manufacturing companies in the UK	Cross-sectional by survey	7a		Supervisor support is a weaker source of job satisfaction in companies with high levels of teamworking.	53% response rate
(Conger, Kanungo et al. 2000)	US manufacturing company	Cross-sectional by survey	7a		Charismatic leadership behaviours were positively associated with follower perceptions of group task performance.	
(Yousef 2000)	Major organisations in United Arab Emirates	Cross-sectional by survey	7a		Consultative, participative leadership behaviour positively associated with higher organisational commitment, job satisfaction and higher performance (self-appraisal).	
(VanYperen,	142 employees in 10	Cross-sectional	7a	Participation in decision	Supervisor support mediates the effect of participation	Supervisors' judgements of

Leadership						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
van den Berg et al. 1999)	departments in UK medium sized distributive trade company	by survey		making measured by 6-point scale ((Van Veldhoven and Meijman 1994)	in decision-making on organisational citizenship behaviour (OCB). The more employees feel that they participate in decision-making, the more they feel supported by their immediate supervisor, which is accompanied by exhibiting more OCB. No support for organisation commitment as a mediator.	OCB.
(Griffith 2000)	N/A	Expert opinion	9a		Champion health care organisations use a combination of will (leadership and commitment) and way (systems and procedures).	

Goal Setting and Feedback						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
Studies on organisational clinical performance						
(Gibson 2001)	Nurses in 3 US hospitals	Controlled quasi-experimental	3a	Effectiveness measured as quality of care by patients. 5-item survey for efficacy.	Individual effectiveness increased with self-efficacy and goal-setting training. Team effectiveness increased with greater group efficacy. Greater group efficacy achieved with goal-setting training	Goal-setting training
(West, Borrill et al. 2002)	61 UK hospitals	Uncontrolled cross-sectional by survey	5a	Comparison of HRM practices (from survey) to patient mortality by hospital	Patient mortality inversely related to: • appraisal • team working • sophistication of training policies	Some variables have small sample size of 21. Appraisal provides feedback.
(Merlani, Garnerin et al. 2001)	Surgical ICU of Swiss hospital	Longitudinal pre-post	5a		Guideline acceptance increased when users were involved in revisions. Iterative education, regular information and monthly feedback associated with positive change in practice.	Feedback
(Holman, Allman et al. 2001)	US Medicare CABG patients (20 hospitals)	Pre-post comparative non-experimental	6a	Alabama hospital compared pre-post, and with comparison state and national sample	Confidential hospital-specific performance feedback associated with improvements in the processes of care for CABG surgery.	Feedback
(National Coalition on Health Care and Institute for Healthcare Improvement 2002)	3 US hospitals	Informal case study	6b		Data on outcomes resulted improvements in quality and safety.	Goal-setting and feedback
Studies on organisational change and innovation performance						
(Sweetman 2001)	81 undergrad students	Controlled post intervention	4a	Measurement of innate levels of creativity. In-basket exercise with measurement of levels of creativity.	Greater creativity with: • expectation for supportive, instructive feedback • provided with creative examples	Feedback
(Shapiro and Kirkman 1999)	US teams of service division of manufacturing	Cross-sectional by survey	7a		Potential for distributive injustice associated with resistance to change, perceptions of	44% response rate

Table 2 Goal Setting and Feedback

Goal Setting and Feedback						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
	company and manufacturing division of textile and food product company				injustice related to perceptions of unfair labour conditions (e.g. layoffs).	
Studies on organisational productivity, market share and financial performance						
(Mann, Samson et al. 1998)	Australian electrical wholesale company	Pre-post experimental, with random assignment to one of 4 conditions	4a	Performance defined as % increase in sales performance.	Benchmarking resulted in greatest improvement in performance.	Feedback
Studies on team performance						
(Weldon and Yun 2000)	31 teams of nurse surveyors in US state department of health	Randomised controlled	3a		Setting shorter-term as well as long-term goals resulted in better team performance, than with the setting of long-term goals alone. Setting shorter-term goals, resulted in more difficult distal goals.	Goal setting
(Durham, Locke et al. 2000)	56 3-person groups of students	Randomised controlled trial	4a	Winter Survival exercise	Better group performance with groups obtained new knowledge or validated prior knowledge through clue seeking.	Feedback
(Durham, Knight et al. 1997)	216 US university students in 72 teams	Randomised controlled	4a	Computerised tank battle simulation	Teams that self-set goals had better performance.	Teams with new, complex tasks should be allowed to set team goals, even if formal goals are assigned. Goal-setting
(Knight, Durham et al. 2001)	264 students enrolled in senior-level management courses at a large US public university.	Randomised, repeated measures	4a	Performance in computer-tank battle simulated exercise.	Performance was highest with difficult goals, with offer of performance incentive. Difficult goals motivated teams to choose strategies with higher levels of risk.	Goal-setting
(Cannon and Edmondson 2001)	51 work groups in US manufacturing company	Cross-sectional by survey	7a		Teams within the same organisation vary significantly in their beliefs about failure. While shared beliefs about failure are	

Table 2 Goal Setting and Feedback

Goal Setting and Feedback						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
					associated with group performance, the type or content of the belief is critical.	
(Gunther McGrath 2001)	56 US new business development projects, manufacturing and service firms	Uncontrolled Cross-sectional by survey	7a		When projects required new knowledge, teams were more effective with greater goal and supervisory autonomy, when projects required more existing organisational knowledge, narrowing and focusing was associated with learning effectiveness.	Rapidly changing environments require higher internal variety.
Studies on individual job performance						
(Kierein and Gold 2000)	N/A	Meta-analysis	1	Pygmalion effect – group or individuals act in accordance with expectations of another.	Effect stronger in military than business organisations, although present in both. Stronger with lower level of initial performance. Same effect for groups and individuals, males and females.	
(Sue-Chan and Ong 2002)	143 undergraduate students at an Australian university	One factor randomised controlled trial	4a		Participatively set goals resulted in higher self-efficacy, goal commitment and performance than assigned goals. Self-efficacy and goal commitment mediated goal assignment performance relationship.	Goal setting
(Lam and Schaubroeck 1999)	108 junior front line supervisors attending training seminar in Hong Kong	Randomised controlled trial	4a	2X2 design, manipulating 2 independent variables – process versus outcomes appraisal and individual versus team appraisal	Compared to outcomes focus feedback, process feedback had more positive effect on performance (as well as appraisal satisfaction and perceived accuracy of appraisal). No effect found for team versus individual appraisal.	Feedback
(Latham and Sejts 1999)	39 young adults hired to make toys	Randomised controlled trial	4a	Assigned to one of 3 conditions: distal goal, distal and proximal goals or ‘do your best’	Proximal goals, through self-efficacy and performance feedback resulted in highest performance.	Goal setting
(Scanlon, Darby et al. 2001)	US managed care plans	Exploratory qualitative interviews	6a	Interviews with multiple respondents from each health plan	Link between measurement of performance and improved performance.	Small sample

Table 2 Goal Setting and Feedback

Climate and Culture						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
Studies on organisational clinical performance						
(Berlowitz, Young et al. 2003)	35 US Department of Veterans Affairs nursing homes	Cross-sectional	6a		Quality improvement implementation positively associated with an organisational culture that emphasises innovation and teamwork.	
(Mallack, Lyth et al. 2003)	US hospital that built a replacement hospital	Case study	6a		Culture strength positively associated with job and patient satisfaction. Significant positive correlation between job satisfaction and patient satisfaction.	
(Savitz 2000)	4 US health care systems	Multiple embedded case studies	6a	Clinical process innovation (CPI) generation, acceptance and implementation of new ideas, tools and/or support systems aimed at improving clinical processes and patient care.	CPI requires commitment and preparedness. Barriers to CPI include: • Communication • Financial disincentives • Organisational adaptation	
(Edmondson 1996)	2 US hospitals	Comparative non-experimental, observation and survey.	6a	8 nursing unit teams from 2 hospitals	Willingness of unit staff to discuss mistakes openly positively influences detected error rate.	
(Shortell, Bennett et al. 1998)	61 US hospitals	Cross-sectional	6a	Performance assessed by CEOs and Directors of Quality Assurance/Improvement – QI impact on human resources development, patient outcomes and financial outcomes.	Participative, flexible, risk-taking culture was significantly associated with quality improvement implementation, which was positively associated with better perceived patient outcomes and human resource development. More difficult to implement in larger hospitals.	No objective measures of performance.
(National Coalition on Health Care and Institute for	John Hopkins Hospital, US	Informal case study	6b	ICU 8 step safety program: • Cultural survey • Educate staff on science of safety	• Education on systems issues • Non-punitive • Senior administrator visible support • Culture that encourages second-	Approach is consistent with findings of (Edmondson, Bohmer et al. 2001)

Table 3 Climate and Culture



Climate and Culture						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
Healthcare Improvement 2002)				- Identify staff's concerns - Analyse event - Implement improvements - Document results - Share stories and disseminate results - Resurvey staff	guessing the doctors	
(National Coalition on Health Care and Institute for Healthcare Improvement 2002)	LDS Hospital, US	Informal case study	6b		Culture where each member of team feel and acknowledge core value of every other member. Collaborative problem solving highlighted by inclusive protocol development process.	
Studies on organisational change and innovation performance						
(Martins and Terblanche 2003)	N/A	Literature review	1		The following factors associated with cultures that support creativity and innovation: - Strategy - Structure - Support mechanisms - Behaviour - Communication.	"...little agreement on the type of organisational culture needed to improve creativity and innovation".(p. 69)
(Australian Institute for Primary Care 2001)	N/A	Literature review	1		Quality initiatives are more likely to be effective when used in an organisation that functions with the following quality principles and practices: - Problem-solving based on data and statistical analysis - Focus on systems and processes - Cross-functional teams - Employee empowerment - Explicit focus on internal and external customers. (i.e. quality initiatives most successful when providers have	Circular reasoning

Table 3 Climate and Culture

Climate and Culture						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
(Ahmed 1998)	N/A	Literature review	1		adopted CQI/TQM) Characteristics of innovation climates and cultures: • balanced autonomy • personalised recognition • integrated socio-technical system • continuity of slack	“...much of the research evidence concerning management practices about innovation cultures and climate remains unsystematic and anecdotal (p. 41).
(Denis, Hebert et al. 2002)	Canadian hospitals	Multiple case studies with embedded units of analysis.	5a	Documented 4 clinical innovations: successful, over-adoption, under-adoption, and prudence.	Mutual influence between innovations and adopting systems – the more the patterns of benefits and risks of the innovation maps to the interest, values and power of the adopters, the greater the success.	
(Anderson and West 1998)	121 primary health, social services, psychiatric and oil company teams	Correlational	5a	Factor analysis to validate Team Climate Inventory (TCI).	5 factor solution – vision, participative safety, task orientation, support for innovation and interaction frequency of the team.	
(Baer and Frese 2003)	Mid-sized German companies in industrial and services sectors	Correlational	7a	Extended group psychological safety to organisational climate for psychological safety – work environment where employees are safe to speak up without being rejected or punished. Performance measured as firm goal achievement and return on assets.	Climates for initiative and psychological safety were positively associated with firm performance and moderated the relation between process innovations and firm performance.	
(Bateman and Rich 2003)	40 change agents of UK automobile manufacturers	21 case studies	7a		Managers can identify specific inhibitors, but find it more difficult to formulate specific enablers. Although cultural change was identified, managers do not know how to change their cultures.	
(Salaman and	Managers in a UK	Qualitative study	7a	Interviews with 20 senior and middle	While innovation recognised as critical for	Interesting case study with

Table 3 Climate and Culture

Climate and Culture						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
Storey 2002)	telecom equipment designer and manufacturer.	of discourse about innovation		managers	continued survival, and managers could articulate radical shift required, and identify responsibility for confronting systemic sources of obstruction. Authors conclude managers were overwhelmed by dominance of market form of organisation.	relevance to paralysis of organisations in face of clearly acknowledged need and incentives for change.
(Trader-Leigh 2002)	US state and federal agency employees, including US foreign affairs agencies and embassies	Exploratory case study	7a	All agencies studies were required to implement the International Cooperative Administrative Support Service (ICASS) System as part of the Reinventing Government movement.	Identified the following key resistance forces to change: • Self-interest • Psychological impact • Tyranny of custom • Redistributive effects • Destabilisation effects • Culture compatibility • Political factors	
(Zwick 2002)	Mannheim Innovation Panel (Janz & Licht 1999) – German manufacturing & service sector.	Cross-sectional by survey	7a	Surveys in 1995 and 1999 5,000 personnel managers. - questions on resistance to innovation asked in 1995 for service sector and 1999 for both sectors. Patterns of internal resistance common to all firms in Panel in all economic sectors.	Resistance to innovations is high when employees fear losing their ‘investment costs’ (e.g. loss of jobs or cannot use newly acquired capital). Can be resolved through employment guarantees, bonus payments, reduction in adoption costs of innovation (reducing skill rendered obsolete, training during working hours, reduced workload during training)	
(Axtell, Holman et al. 2000)	148 machine operators of a beverage manufacturer in England.	Cross-sectional by survey	7a		Individuals with greater role self-efficacy, more autonomy and greater concern for work issues associated with more suggestions for improvement. Implementation of suggestions associated with greater team leader support, higher team method, greater diversity of team responsibilities, more support for innovation, higher levels of participation and support from management.	98% response rate. Self-report data.

Table 3 Climate and Culture

Climate and Culture						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
(Guimaraes and Armstrong 1998)	49 managers of 19 US organisations	Cross-sectional	7a		Effectiveness in implementing organisational culture changes in change initiatives statistically significant between high and low performing companies.	Convenience sample
(Judge, Fryxell et al. 1997)	8 new publicly held US biotechnology firms	Multiple interviews	7a		Highly innovative units were focused communities, while less innovative units behaved as traditional bureaucratic departments. Management practice to develop community: - Balanced autonomy - Personalised recognition systems - Integrated sociotechnical systems - Continuity of organisational slack.	
(Pech 2001)		Expert opinion, review	10a		Dominant culture of conformity and followership discourages innovation. Suggests democratic leadership, development of trust, devolved decision-making.	
(Detert, Schroeder et al. 2000)		Expert opinion	10a	Framework for defining and measuring organisational cultures using TQM as exemplar.	Identifies 8 organisational culture dimensions from systematic review of culture literature; maps to TQM values and beliefs. Large gaps between espoused and observable culture make changes to TQM difficult.	Theoretical framework only; may be useful tool for analysing culture of organisations in relation to TQM values and beliefs.
(Phelan and Birchall 2002)		Expert opinion	10a or b	Explication of principles based on literature and experience	Advocacy for learning organisation grounded in 4 principles: culture; dialogue; systems thinking; determination	
(Schein 1996)		Expert opinion	10a		Different cultures of executive, engineering and operators hinder organisational learning and innovation. Cultures have different views of successful outcomes.	Implications for self-report data/self-evaluation of performance outcomes.
Studies on organisational productivity, market share and financial performance						
(Huq and N. 2000)	7 US hospitals	Uncontrolled qualitative study	6a/b	Analysis of 8 workforce cultural factors in relation to CQI/TQM	One of 7 hospitals categorised as highly successful because of high score on all 8	Circular argument – high score taken to equal greater

Table 3 Climate and Culture

Climate and Culture						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
				characteristics.	dimensions. No evidence of performance or outcomes.	capacity to achieve CQI.
(Glisson and James 2002)	US state agency for child welfare and juvenile justice	Observational study in 33 case management teams (283 participants)	7a	Relates culture, climate, structure, work attitudes and turnover using questionnaires	Establishes climate, culture structure and work attitudes as distinct constructs. Work attitudes and psychological climate strongly correlated. Team level effects demonstrated. Team climate and team constructive culture related to work attitudes. Constructive team cultures most important predictor of positive work attitudes, higher service quality ratings and less turnover.	Common method error a risk, with some control. Question applicability in other service types.
(Matsuno, Mentzer et al. 2002)	1000 US manufacturing companies	Cross-sectional by survey, random sample	7a	Entrepreneurial proclivity defined as the organisation's predisposition to accept entrepreneurial practices through its preference for innovativeness, risk taking etc.	Entrepreneurial proclivity associated with higher performance achieved through market orientation. Entrepreneurial organisations tend to have low levels of centralisation and departmentalisation.	Cross-reference to structure (low centralisation and departmentalisation)
(Guthrie 2001)	164 New Zealand businesses employing at least 100	Cross-sectional by survey	7a	Developed measure of high-involvement work practice systems.	High-involvement work practices are associated with low turnover and higher productivity.	23% response rate
(Borucki and Burke 1999)	US retail organisation	Cross-sectional by survey	7a	Face-to-face service encounters	Organisational values stressing importance of customer service, organisational practices that reinforce these values are positively associated with service-oriented sales behaviours, which in turn is positively associated with store performance.	
(West, Smith et al. 1998)	46 departments in 14 universities.	Longitudinal	7a	Focus on research excellence	Effectiveness influences organisational climate – climate does not influence effectiveness. Positive research rating at T1 associated with a positive climate at T2.	
(Benkhoff 1997)	Branches of a German bank	Cross-sectional by mailed survey	7a	Sales targets, sub-target for private savings and operating profit used as measures of performance.	Staff commitment was associated with positive branch performance.	

Table 3 Climate and Culture

Climate and Culture						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
(Sorensen 2002)	Large US firms in 18 different markets	Uncontrolled longitudinal (re-analysis of Kotter & Heskett)	7a	Comparison of strength of culture to mean performance (ROI, net income growth, change in share price) over 10 years	Stronger culture led to less variable, more reliable performance, but impact on reliability declines in increasingly volatile environments	Strong culture firms excel at exploiting established competencies but not so good at exploring and discovering new competencies for changing environments.
(Youngson 2002)	NZ health system reform	Expert opinion	10b	Analysis of current problems in NZ health system	Advocacy for Senge's ideas of learning organisations and for Complex Adaptive Systems theory approach to quality and safety.	Thoughtful expression of beliefs by a clinician leader.
Studies on individual job performance						
(Riketta 2002)	N/A	Meta-analysis – 111 samples from 93 published studies.	1	Attitudinal organizational commitment (AOC) is the relative strength of an individual's identification with and involvement in an organisation.	AOC correlated with job performance. Stronger with extra-role performance, white-collar workers.	Over emphasis on white collar and Anglo-American studies.
(Chen, Tsui et al. 2002)	Chinese employees in manufacturing and services sectors - 333 supervisor-subordinate sets.	Cross-sectional by survey	7a	Validation of a loyalty to supervisor scale. Supervisors completed surveys, rated employee performance, and rated employees completed surveys.	Performance related more to loyalty to supervisor then to organisational commitment.	83.5% response rate for supervisors, 74% for subordinates. Results may be confounded by use of supervisors rating of performance. Unique to Chinese culture?
(Lam, Schaubroeck et al. 2002)	Hong Kong and US branches of a multinational bank.	Cross-sectional by survey	7a		Justice perceptions related to job satisfaction, performance and absenteeism.	No effect found for country.

Table 3 Climate and Culture

Systems and Processes						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
Studies on organisational clinical performance						
(Lee, Chang et al. 1999)	North American and Northern European hospitals	Literature review	1	17 studies met criteria	In 6 of 17 studies support for association between nursing care processes and health related outcomes.	Surprisingly, support was minimal for effectiveness of nursing care processes.
(Somers, Marton et al. 2000)	US primary care practices	RCT	3a	Home visits, regular monitoring on status.	Intervention with nurses and social workers collaboratively assisting with the care of chronically ill seniors resulted in reduced hospital admissions and doctor visits, while maintaining function.	Although cited as evidence of effectiveness of teams (Borrill, Carletta et al. 2002) effects more likely linked to care processes
(Enderby 1997)	Private hospital in Australia	Case study	5a	Doctoral thesis.	Organisational learning requires: • shared vision • time and space for reflection • action learning teams • congruence, trust, leadership • immediate 'hard-wiring' of gains • measurement focus • use of a pilot study. Need to address personal-collective and structural-cultural dimensions of organisational learning.	"A learning organisation is one which continuously monitors or captures data about its performance and health, reflects on that data and modifies its behaviour in the light of the knowledge gained, so as to ensure its long term survival and growth. A learning organisation is one that is continuously improving" (p. 191)
(Dopson, Fitzgerald et al. 2002)	NHS primary and secondary providers	Case study. Comprising 7 studies and 49 cases (1,400 interviews).	6a	Researchers from UK universities independently studying the NHS in the 1990s combined their results.	Context is significant Stronger evidence not diffused faster – interpreted and weighed in relation to experience • History of favourable relationships among professionals and management groups • Sustained political and managerial support Access to opportunities to share information and ideas in local context.	Characteristics of receptive context: • Favourable history of individual relationships • Supportive culture • Effective relationships among groups • Opportunities to share information
(Uribe,	Doctors & nurses	Nominal group	6a	Developed a standard instrument	The following were found to be significantly	17.3% response rate (had expected

Table 4 Systems and Processes

Systems and Processes						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
Schweikhart et al. 2002)	of departments of internal medicine and surgery in a large US academic medical centre	session Cross-sectional by survey		to measure the likelihood of factors to act as barriers to reporting medical errors.	likely to act as barriers: • Time involved in documenting • Extra work in reporting • Not able to report anonymously • No negative outcome, so unnecessary • Fear of lawsuits • Hesitancy to 'tell' on someone	15%).
(Yasin, Zimmerer et al. 2002)	US hospitals	Uncontrolled observational study	6a	Survey of all hospitals in the State, measuring implementation and success with new management methods.	No significant differences between for-profit and not-for-profit hospitals. High reported success rates with CQI and TQM.	36% response rate of CEOs and quality managers. Pedestrian description of survey opinions.
(Fernandez 2001)	Emergency department innovations in one large general hospital in Spain	Multiple embedded case studies	6a		No single pattern for all innovations observed, but a single sequence pattern provides a better description of the routine innovation process. A multiple sequence pattern gives a better description of the radical innovation process. Innovation process is influenced by individuals with interests affected by the innovation, playing different roles at different times.	More effective to gain support from those affected by innovation than by decree from authority.
(Lipshitz and Popper 2000)	2 wards in Israeli teaching hospital	Case study	6a	Test construct of organisational learning mechanisms (OLM) and related cultural values using observation and semi-structured interviews with staff.	Qualitative support for proposition that OLM's embedded in a learning culture enable learning to occur in organisations and may enable learning by organisations (i.e. change to procedures and informal practices).	Useful attempt to make concept of learning organisation more explicit and more amenable to study.
(Savitz, Kaluzny et al. 2000)	US health system	Replicated case studies	6a	Sites are members of Centre for Health Management Research/Centre for Organized Delivery Systems	Life cycle model for continuous clinical process innovation – relationship between tolerance for change and experience with innovation over time. Use of this model assists in identifying intervention points and	

Table 4 Systems and Processes

Systems and Processes						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
					knowledge needs.	
(Lain, Young et al. 1998)	Cardiac surgery service in US hospital system	Case study	6a	Institute for Healthcare Improvement collaborative	26% variable cost reduction. Barriers included poor communication – addressed by core team empowering other staff members to generate process changes.	Clear goals, display of data and doctor leadership were important
(Mitchell, Shannon et al. 1996)	25 critical care units of US hospitals	Correlational	6a	Distance from ideal calculated on dimensions of potential for expertise, standardisation, discretion, and work and information flow.	Although units closest to ideal were not associated with better clinical outcomes, these units were perceived by doctors and nurses as having higher quality of care. In general distance from ideal pattern score was associated with features of a good place to work, not clinical outcomes.	
(Scott 2001)	US hospitals	Expert opinion	10a		• Define service expectations • Help everyone understand the behaviour expectations • Create standards and guarantees	
(World Health Organization 2001)	N/A	Report by the Secretariat	9b		Enhancing patient safety requires: • Increased ability to learn from mistakes • Greater capacity to anticipate mistakes • Identification of knowledge resources • Improvements in health care delivery systems.	
Studies on organisational change and innovation performance						
(van der Aa and Elfring 2002)	10 Dutch service firms	Explorative case study	7a	Forms of innovation: • Multi-unit organisation • New combinations of services • Customer as co-producer • Technological	Supporting processes for multi-unit: • Standardisation of service management system • Making service concept explicit • Experimentation using benchmarking. Supporting processes for new services: • Organising linkages between	

Table 4 Systems and Processes

Systems and Processes						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
					services • Transparency in service offering • Cross-selling.	
(de Weerd-Nederhof, Pacitti et al. 2002)	Chemical, soap and personal products, and food and cleaning supplies firms	Case study	7a		Learning tools: • Job rotation • Innovation process planning • Project review Organisational learning process is not linear, with steps highly dependent. Existing organisational knowledge base is important.	
(Yahya and Goh 2002)	Mangers in Malaysian companies.	Cross-sectional by survey	7a		The following were found to be associated with knowledge management: • Training in creativity, customer relationship management, quality incentives and empowerment • Feedback from internal customers • Clear and simple group incentives, knowledge sharing and contribution, innovative work approach.	Suggest that if a company wants to become a knowledge organisation it must start with quality training.
(Eby, Adams et al. 2000)	2 divisions of a US sales organisation	Cross-sectional by survey	7a	The divisions were scheduled to undergo large-scale organisational change.	Perceived organisational support, flexible policies and procedures and logistics and systems support were positively related to organisational readiness for change.	Convenience sample
(Johnson, Donohue et al. 2001)	Large US state government engineering and technical agency	Cross-sectional by survey	7a	Measured perceived innovativeness, not innovation performance	Communication quality and interpersonal communication were found to influence both innovative involvement and perceived innovativeness, while mediated communication influenced innovation involvement.	Greater perception of innovation with access to more information
(Tasi 2001)	Business units in a petrochemical company and food-manufacturing	Cross-sectional by survey	7a	Network position related to access to information, with centrality associated with more access to information.	Interaction between absorptive capacity and network position has significant positive effects on business unit innovation and performance.	More innovation with greater access to information and ability to use the information

Table 4 Systems and Processes

Systems and Processes						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
	company			Absorptive capacity is ability to assimilate and transfer knowledge from other units.		
(Duncan, Mouly et al. 2001)	New Zealand police service	Case study	&a	Implementation of Policing 2000 change initiative.	Recommendations for effectiveness change: • Institutionalise change through shared mindset • Dissociate change from past efforts • Develop a desire for change • Develop change leaders • Align support and reward systems • Communicate change clearly • Change with consistency.	
(Service and Boockholdt 1998)	US managers	Cross-sectional by survey	7a	Survey on Innovation Management developed for the study.	Innovation characteristics mediated by communications, and HR practices, mediated by commitment associated with successful innovation. Greatest success in innovation related to human relations practice and innovation's characteristics.	12.6% response rate
(O'Dell and Grayson 1998)	US firms: Chevron, Texas Instruments, AMP Inc.	Expert opinion	10a	American schools stress individuality and competition, not collaboration and sharing in learning.	Identified 4 approaches: • Benchmarking teams • Best-practice teams • Knowledge networks • Internal audits	Internal knowledge transfer is a people to people process – relationships are required for meaningful sharing and transfer.
Studies on organisational productivity, market share and financial performance						
(Walston, Burns et al. 2000)	US general hospitals with more than 100 beds	Cross-sectional by mailed survey	6a	Performance defined as change in cost per adjusted patient day relative to the market in which the hospital is located.	Reengineering in hospitals without integrative and coordinating mechanisms (steering committees, project teams, codification of the change process and executive involvement) associated with lower cost performance. Executive involvement was required in core clinical changes to be associated with positive effect.	

Table 4 Systems and Processes

Systems and Processes						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
(Barraud-Didier and Guerrero 2002)	180 French HR managers of industrial and service sectors.	Cross-sectional by survey	7a		Positive association between empowerment, identification, communication and training HR practices with performance. Combining these practices has a greater impact than using them separately.	
(Way 2002)	National Employer Survey of 3081 US firms, limited to 446 with fewer than 100 employees	Cross-sectional	7a	High performance work systems (HPWS) distinct but related HRM practices – staffing, compensation, flexible job assignments, teamwork, training and communication	HPWS associated with lower voluntary turnover and higher perceived productivity, HPWS do not always produce outcomes that exceed the costs of the systems.	
(Ensley and Pearce 2001)	196 new venture managers in 88 firms for 1994 and 192 managers from 70 firms in 1995	Longitudinal cross-sectional	7a	Performance measured as sales growth, profitability and sales and revenue volume.	The team processes leading to shared strategic cognition in top management teams predicted performance better than the outcome of shared strategic cognition.	17.6% response rate in 1994 and 18.0% response rate in 1995
(Hitt, Bierman et al. 2001)	Large US law firms	Time series and cross-sectional by secondary data collection and survey	7a	Independent variables: human capital, leverage, service diversification and geographic diversification. Performance: ratio of net income to total firm revenue.	Curvilinear relationship between human capital and performance – early costs may exceed marginal productivity, but as human capital accumulates, productivity increases and average costs decrease. Leveraging the most valuable human capital is also associated with performance.	May not be generalisable beyond large service firms.
(Koys 2001)	28 stores of a regional restaurant chain	Longitudinal cross-lagged	7a		Employee attitudes and behaviours at T1 are related to organisational effectiveness at T2.	HR outcomes influence business outcomes.
(Perry-Smith and Blum 2000)	527 US firms	Cross-sectional by survey	7a	Performance measured as market and profit-sales growth	Organisations with a higher range of work-family policies were positively associated with performance.	
(Lee and Miller 1999)	129 Korean companies in textiles,	Cross-sectional by survey.	7a		Organisational commitment to employee well-being (OCE) associated with effective deployment of positioning strategies, or	

Table 4 Systems and Processes

Systems and Processes						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
	machinery, automotive parts and electronics				conversely, OCE has a strong impact on performance with a strong strategy (i.e. having a strong strategy appropriately channels motivational benefits of OCE.	
(Werner and Mero 1999)	362 Major League (North American) Baseball players	Cross-sectional by analysis of secondary salary and performance data	7a	Sports performance	External and internal underpayment negatively associated with changes in performance.	Study using baseball players may not be generalisable.
(Delaney and Huselid 1996)	US firms sampled in the National Organizations Survey	Cross-sectional by survey	7a	Progressive HRM: employee participation and empowerment, job redesign, employee training, performance-contingent incentive compensation.	Progressive HRM practices are positively associated with perceptual measures of organisational performance.	
(Youndt, Snell et al. 1996)	512 US manufacturing plants in the metal-working industry	Cross-sectional by survey	7a	Performance construct was operational performance.	HR practices designed to professionalise employees and create egalitarian work (i.e. human capital enhancing) environment positively influence organisational performance, when matched with quality management strategies.	
(Huselid 1995)	Publicly held US firms from all major industries	Cross-sectional by database & survey.	7a	High performance work practices: employee skills & organisational structures and employee motivation. Compact Disclosure database for financial information.	High performance work practices associated with lower employee turnover, greater productivity and better corporate financial performance.	968 firms responded 28% response rate
(MacDuffie 1995)	62 international motor vehicle assembly plants	Cross-sectional by survey	7a	Performance measured as labour productivity and new car quality.	Bundling of HR practices into a system that is integrated with production/business strategy is positively associated with better performance, as compared with traditional mass production and HR systems.	

Table 4 Systems and Processes

Systems and Processes						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
(Snell and Youndt 1995)	140 US firms with single business unit, multiple industries	Cross-sectional by survey	7a		Behavioural and input approaches to HRM associated with better firm performance than output based HRM practices.	
Studies on team performance						
(Alper, Tjosvold et al. 2000)	61 self-managing teams in a US manufacturers of electric generators.	Cross-sectional	7a	Team managers provided single rating of team effectiveness.	Cooperative approach to conflict was positively related to conflict efficacy. Competitive approach to conflict was negatively related to conflict efficacy and team effectiveness.	
Studies on individual job performance						
(Holtom, Lee et al. 2002)	US correctional officers	Cross-sectional	7a	Developed measure of work status congruence	Congruence with work status requests of staff is positively associated with job satisfaction, organisational commitment, employee retention and in-role and extra-role performance.	
(Randall, Cropanzano et al. 1999)	2 US manufacturing firms and 1 public sector organisation	Cross-sectional by survey	7a	In-role and organisational citizenship performance rated by supervisors	Tested organisational politics and support – only organisational support was related to job performance.	

Table 4 Systems and Processes

Strategy						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
Studies on organisational change and innovation performance						
(Ozsomer, Calantone et al. 1997)	140 US firms involved in consumer or industrial product innovation	Cross-sectional by mailed survey	7a		Strategic posture was found to be the most important factor associated with innovative performance. An aggressive, competitive, risk-taking strategy is associated with innovativeness.	
(Goes and Park 1997)	US hospitals (California)	Cross-sectional.	6a	Operating margin used as the indicator of slack (assume better performers would generate more funds. Annual state hospital disclosure reports and survey data from American Hospital Association.	Structural links (membership in a system), institutional links through trade associations, and resource links through key personnel were positively associated with innovation. Management contract was negatively associated with innovation. No significant differences between public and not for profit hospitals. Larger hospitals and hospitals with greater organisational slack were more likely to innovate.	
(Nohria and Gulati 1996)	National subsidiaries of a US and Japanese consumer electronics companies	Cross-sectional by mailed survey	7a	Slack defined as pool of resources in excess of the minimum necessary to produce a given level of organisational output.	Environmental context has no influence on capacity to innovate. Inverse U-shaped relationship between slack and innovation.	
Studies on organisational productivity, market share and financial performance						
(Trinh and O'Connor 2002)	US urban hospitals	Longitudinal	6a		Environmental context influences business enhancement strategies, whereas organizational characteristics influences cost-control strategies. A strategic change that contributes to one type of performance can negatively impact another.	
(Love, Priem et al. 2002)	US autonomous manufacturing firms	Cross-sectional by survey	7a		Explicit strategy shows greatest benefits in decentralised firms, while less articulated strategy is likely most beneficial to centralised firms.	
(Mullane 2002)	US funeral services firm and packaged goods company	Case study	7a		Senior executives feel mission statements are positive influences on firm performance.	Hearsay – no real proof of impact provided.
(Terzioviski 2002)	Manufacturing companies in Australia and New Zealand	Cross-sectional by survey	7a		Bottom-up strategy associated with productivity and customer satisfaction. Top-down strategy associated with relative technological competitiveness. Highest predictors of	Response rates of 32% for Australia and 38% for New

Table 5 Strategy



Strategy						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
					productivity: • use of change champions • flexibility, multi-skilling • measure customer satisfaction.	Zealand.
(Baker and Sinkula 1999)	US multi-industry study	Cross-sectional by mailed survey	7a	Learning orientation is an organisational characteristic that addresses a firms ability to value knowledge-questioning behaviours.	Higher organisational performance associated with marketing orientation within an appropriate climate for learning. Suggest organisational learning is associated with higher performance.	

Table 5 Strategy

Training and Development, including Staff Competencies and Characteristics						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
Studies on organisational change and innovation performance						
(Bovey and Hede 2001)	9 federal and state government agencies in Brisbane during implementation of major change.	Cross-sectional by survey. Individuals surveyed during the resistance phase of the change process.	7a	Factor analysis resulted in 5 defences and 2 behavioural intentions.	Individuals with higher maladaptive defence mechanisms had higher resistance to change. Those with higher adaptive defence mechanisms had lower resistance to change.	
(Hyland, Gieskes et al. 2001)	Employees involved in product development process in Australian and European firms	Cross-sectional	7a		Learning can be influenced by cultural factors based on occupational background. Occupational groups may establish barriers to protect their knowledge base.	
(Jensen and Harmsen 2001)	Product development process in 4 Danish companies.	Case study	7a		Found support for 4 knowledge dimensions (Leonard-Barton 1992): - Employee knowledge and skills - Employee knowledge and skills embedded in technical systems - Managerial systems - Values and norms infused through other dimensions.	
(O'Connor and Rice 2001)	12 breakthrough innovations	Case studies initiated in 1995	7a		Opportunity recognition for innovation is highly dependent on individual initiative and capacity and not on organisational systems and processes.	Suggest: - communicate need for innovation - organisational enablers - project oversight board - informal networks - Innovation structure
(Au and Enderwick 2000)	Hong Kong businesses	Cross-sectional by mailed survey	7a		Attitude toward adoption of technology influenced by: - Perceived difficulty - Adoptive experiences - Suppliers' commitment - Perceived benefits - Compatibility	13% response rate

Table 6 Training and Development, including Staff Competencies and Characteristics

Training and Development, including Staff Competencies and Characteristics						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
					• Enhanced value.	
Studies on team performance						
(Salas, Mullen et al. 1999)	11 articles with 16 tests.	Meta-analysis of effect of team building on performance.	1	Team building included goal setting, interpersonal relations, problem solving and role clarification.	Overall no support for the effectiveness of team building interventions in improving team performance. No effect in studies with objective measures of performance; some effect in studies with subjective measures of performance.	Only role clarification made any contribution to performance.
(Marks, Burke et al. 2002)	147 undergrads from US university	Between-subjects single factor RCT	4a	Laboratory setting with Team Wargame Interaction Simulation training (TWIST)	Cross-training positively influenced the development of shared team interaction knowledge. More consistent perceptions of team interaction information resulted in better performance.	Unable to determine what level of cross training was sufficient to achieve the effect.
(Hui, Lam et al. 2001)	3 US branches of a large multinational bank	Repeated measures quasi experimental	4a		Customers were most satisfied with the service quality where good organisational citizens had been trained as service quality leaders.	
(Graetz 2002)	Multi-national telecommunication company.	Observational	7a	Firm conducted a series of workshops to instil strategic thinking skills among employees.	Left-brain thinking for strategic planning; right-brain thinking for the creative side of strategy making. Need to ensure both styles represented in strategic planning teams.	Suggest: • reward system • training & facilitation • managing upwards • modelling desired behaviours • whole brain activities.
(Pearce, Gallagher et al. 2002)	71 change management teams in large US automotive manufacturing firm	Longitudinal field study	7a	Team potency defined as collective belief within a group that it can be effective.	Team effectiveness and team potency (collective efficacy) are reciprocally and longitudinally related.	
Studies on individual job performance						
(Tischler, Biberman et al. 2002)	N/A	Review of research	1		Both emotional intelligence (EI) and spirituality are positively associated with individual work success. Unclear whether it is possible to develop EI.	

Table 6 Training and Development, including Staff Competencies and Characteristics

Training and Development, including Staff Competencies and Characteristics						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
(Axtell, Wall et al. 2002)	UK distribution company that is implementing new technology	Longitudinal data by survey	7a	Sample 325 at T1 and 225 at T2.	Increased exposure to change was related to increased acceptance of change – dependent on occupational group with front line staff having greater impact.	
(Mehra, Kilduff et al. 2001)	Small US high tech firm involved in the chemical analysis of complex compounds	Cross-sectional by survey	7a		High self-monitors associated with central positions in social networks. High self-monitors become more central the longer they stay in the organisation. Self-monitoring and centrality in social networks independently predict individual workplace performance.	88 and 100% response rate
(Fulmer, Gibbs et al. 2000)	35 US organisations from a variety of industries	Case study	7a		Best-practice leadership development includes: • Awareness – of external challenges, emerging business opportunities, internal development needs • Assessment – assess the impact of the development program • Alignment – integration of assessment, development, feedback, coaching and succession planning • Action – not knowledge is the goal • Anticipation – anticipate the future.	
(Sandberg 2000)	Department of Engine Optimization for Volvo in Sweden	Uncontrolled interviews, theory-building	7a	Phenomenography approach.	Workers have levels of conceptualisation of their work – training will only be effective if it includes the current and future levels of conceptualisation.	
(Smith and Sharma 2002)	N/A	Expert opinion	10a		Performance is dependent on will, focus and capability. Organisations tend to overdevelop capability, under-develop focus and do not develop will at all.	
(Pfeffer and Sutton 1999)	N/A	Expert opinion	9a		Knowledge of how to enhance performance is not easily transferred within or between firms. Firms have gaps between what is known and what is done.	Suggest: • Philosophy • Knowing comes from doing and teaching

Table 6 Training and Development, including Staff Competencies and Characteristics



Training and Development, including Staff Competencies and Characteristics						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
						others how • Action counts • Mistakes • Drive out fear • Measure what matters

Table 6 Training and Development, including Staff Competencies and Characteristics

Structure, including Teamwork						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
Studies on organisational clinical performance						
(Ross, Rink et al. 2000)	Primary care teams in 2 UK health authorities	Cross-sectional by survey, interviews, time diaries	5a	Studied change to integrated nursing among primary care teams.	Change limited by lack of common set of values. Change seen as improving the organisation rather than the delivery of care. Characteristics of the teams scoring well on the team survey: • strong leadership • effective facilitation • stability of members.	
(Cott 1997)	3 teams in a multilevel Canadian geriatric care facility	Cross-sectional by survey	5a	Descriptive study of teamwork, no link to performance	Multi-professional teamwork related to decision-making and problem solving, Nursing teams had a more hierarchical mechanistic structure and were involved in task-oriented work.	
(Field and West 1995)	96 members of primary health care teams in 6 practices	Qualitative	5a		Good practice in teamwork: ▪ Facilitators ▪ Arrangements to enable meeting attendance ▪ Training.	“The literature suggests that effective teamwork is difficult to achieve in practice and this was well illustrated in this study” (p.129)
(Borrill, Carletta et al. 2002)	Health care teams (primary, community and secondary health care teams) in the UK NHS	Cross-sectional, case study	5b	Patient mortality calculated on deaths within 30 days of emergency surgery and deaths after admission for hip fracture, using Sunday Times Mortality Index.	The effectiveness and innovativeness of teams positively associated with: • clarity of team’s objectives • higher level of participation in the team • higher level of commitment to quality • higher level of support of innovation. Those working in teams associated with better mental health than individuals in looser groups or working alone, likely due to greater role clarity and better peer support. Significant negative relationship between	Conclusions of this study: • NHS needs to be developed as team-based not hierarchical • NHS managers trained to manage team-based organisations

Table 7 Structure, including Teamwork

Structure, including Teamwork						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
					percentage of staff working in teams and patient mortality. Diversity of Primary Care Groups associated with higher team innovation.	
(West and Slater 1996)	UK primary health care teams		5b		Potential benefit of teamwork not realised, as a result of lack of effective communication and teamworking practices.	
(Yeatts and Seward 2000)	US rural nursing home		6a		Enhanced communication among team members positively associated with better resident service. Higher performing teams displayed: • High levels of respect for members • Listening • Members were not afraid to disagree when they held different views.	
(McConnell 2000)	US nursing homes	Case studies	6a	Self-managed work teams (SMWT) – permanent, depend on other members, make management decision related to work	Self-managed work teams associated with higher performance as compared to traditional teams.	
(Higgins and Routhieaux 1999)	37 teams from 3 US hospitals	Cross-sectional by interview and survey	6a	All hospitals undergoing change initiatives to improve quality of care	Found 8 factors associated with team effectiveness. Organisational: Team member selection & composition (including doctor participation), use of facilitators. Team-level: meeting frequency, communication, team leader. Individual: hours per week on team activities, willingness to serve on team.	Team leader opinion of team effectiveness.
(Alexander, Lichtenstein et al. 1996)	105 multidisciplinary treatment teams from US Veterans Affairs long term psychiatric hospitals	Cross-sectional by survey	6a	Team functioning measures how cohesively and harmoniously the team operates – does not mean	Older team members, doctors and social workers assessed team functioning more positively. The greater the diversity on team-level characteristics, the more negative team	No random assignment

Table 7 Structure, including Teamwork

Structure, including Teamwork						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
				team achieves positive results.	members assessment of team functioning. The greater the gender diversity, the more positive the assessment of team functioning.	
(Vinokur-Kaplan 1995)	15 teams of US psychiatric hospitals	Cross-sectional by survey	6a	Effectiveness measured as: standards met, cohesion of team. Individual well-being and team member's evaluation.	Results supported Hackman's concept of team effectiveness. Effectiveness associated with: • Clear task structure • Group composition • Core norms • Performance of members.	Developed own survey instrument – not sure appropriately validated. Subjective performance evaluation.
(Parker, Charns et al. 2001)	US integrated healthcare delivery systems	Case studies/ expert opinion	9a	Interviews with 14 senior executives	Organising with clinical service lines thought to: • improve planning and decision making • reduce inter-facility friction • reduce costs • improve focus on clinical areas	
(Yourstone and Smith 2002)	N/A	Expert opinion	10a	Based on error reduction experience in aviation industry and US Navy.	Nested authority structures required to reduce errors.	
Studies on organisational change and innovation performance						
(Paulus 2000)	N/A	Literature review	1		Factors in the literature associated with creativity and innovation in groups include: • Challenging goals • Structured group interaction • Autonomy • Supportive environment. Tend to underestimate the difficulty in groups ensuring full productivity.	
(Huy 2001)	US private sector businesses	Case study	7a	6 year observational and interview study of middle and senior managers	Senior executive who learn to recognise, respect and deal fairly with the most influential middle managers will improve the odds of realising organisational change.	
(Cady and	50 problem-solving teams	Cross-sectional	7a		Racial diversity of team positively related to	Newly formed teams may not

Table 7 Structure, including Teamwork

Structure, including Teamwork						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
Valentine (1999)	of a US high tech Fortune 500 company				quantity of ideas generated. Gender diversity negatively associated with quality of ideas generated. As quantity of ideas increases, quality of ideas decreases. Team diversity no impact on quality of ideas.	have had sufficient time together to leverage diversity.
(Chang and Harrington 1998)	Retail chains	Mathematical modelling	7a		Centralised organisation preferred when innovation opportunities are moderate, decentralisation is preferred when innovation opportunities are rich. Centralisation is better in complex environments.	
Studies on organisational productivity, market share and financial performance						
(Gibson 1999)	294 US and Hong Kong university students	Randomised controlled trial	4a	Looking Glass Inc business simulation	Support for a contingency approach to group efficacy. Task interdependence moderated the relationship between group efficacy and effectiveness.	
(Richardson, Vandenberg et al. 2002)	US private sector (for profit and not for profit) behavioural treatment centres	Cross-sectional	6a		High-decentralisation growing centres associated with better financial performance at Time 2, as compared with low-decentralisation centres and high decentralisation but shrinking centres.	
(Hunter 2002)	6 Canadian research-based organisations	Case study	7a		Correlation between type of structure and life cycle. Performance associated with flexibility and individual specialization.	
Studies on team performance						
(Jackson 2002)	Australian insurance company	Cross-sectional	3a	Learning styles survey (LSQ) (Honey and Mumford 1992)	Team designed to achieve a balanced learning process (i.e. appropriate LSQ mix) associated with better performance.	Need different skills in the team at different times in the completion of the team tasks.
(Schmidt, Montoya-Weiss et al. 2001)	411 subjects	Randomised controlled trial	4a		Decision-making teams make significantly more effective new product development review decisions compared to individuals, with virtual teams making more effective decisions than face-to-face teams.	

Table 7 Structure, including Teamwork

Structure, including Teamwork						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
(Mohammed, Mathieu et al. 2002)	120 students enrolled in hotel, restaurant and institutional management course at a US university.	Randomised cross-sectional	7a		Different aspects of performance were predicted by different team and task-related composition variables.	
(De Drue and Van Vianen 2001)	27 Dutch organisational teams	Cross-sectional by survey	7a	From public television, consulting, financial planning and accounting, research and development	Relationship conflict avoidance has positive association with team performance.	Supervisor assessment of performance. Note focus on relationship conflict, not task-related conflict.
(Jehn and Mannix 2001)	153 MBA students at three U.S. business schools	Longitudinal	7a	3 person teams studied for one semester.	Team performance associated with low but increasing levels of process conflict, low levels of relationship conflict, with a rise near project deadline, and moderate levels of task conflict at the midpoint of group interaction. All types of conflict were lower in low-performing teams.	Is one semester an accurate reflection of the term of teams in organisations? Can performance in schoolwork be considered as a proxy for performance in work?
(Keller 2001)	93 applied research and new product development groups in aerospace, energy, chemicals and electronics industries.	Cross-sectional by survey	7a	646 professionals included in sample, 84% male	Cross-functional groups were associated with better technical quality, better budget performance, faster schedule performance, through the effects of external communication.	
(Miller 2001)	176 US undergraduate management majors	Cross-sectional	7a	Self-selection to teams, no random assignment	Distribution of KSA capabilities associated with better performance than high overall KSA capability in the team. Positive correlation between number of meetings and team success.	5 KSA factors for high team performance: conflict resolution, collaborative problem solving, communication, goal-setting and performance management, planning and task coordination (Stevens and Campion 1999).
(Sparrowe, Liden et al. 2001)	US 47 workgroups in large public university, small manufacturing firm, large distributor of industrial products, 2 plants of a	Cross-sectional by survey	7a	Analysis of 38 groups, with performance assessed by supervisor.	Individuals central to work group advice networks had higher assessed performance. For groups, centrality was related to negative group performance.	Results may be confounded by use of supervisors rating, as opposed to more objective measures of performance.

Table 7 Structure, including Teamwork

Structure, including Teamwork						
Citation	Setting	Study Type	Level	Scope/Variables	Outcomes/Results	Comments
	consumer products company.					
(McDonough 2000)	Membership of the US Product Development & Management Association	Cross-sectional by survey	7a		Cross-functional team success related to: ▪ Clear, unchanging goals ▪ Team leadership ▪ Cooperation	14% response rate
(Devine, Clayton et al. 1999)	US organisations	Cross-sectional by survey	7a	Both random and targeted samples	Interpersonal conflict the best predictor of perceived team effectiveness. No clear pattern of team structure or composition on effectiveness.	Found a general lack of compensation incentives or feedback on team performance.
(Dunphy and Bryant 1996)	N/A	Expert opinion	9a		Based on a review of the literature and case studies, team multi-skilling has greatest positive impact on cost, value and innovation; self-managed teams have greatest impact on value and innovation and self-leadership teams only impact innovation. Organisations consistently underestimate the costs of teams.	Suggests a need for new, agreed measures of team performance.
Studies on individual job performance						
(Blau and Lunz 1999)	US medical technologists	Longitudinal random survey	6a	Surveys sent to sample of US medical technologists (MTs) in 1993, 1994 and 1995.	Evening, night and rotating shift MTs had lower task enrichment than day shift MTs. Rotating shift MTs did not have lower work attitudes than fixed shift MTs.	

Table 7 Structure, including Teamwork

Quality Management, CQI and TQM						
Citation	Setting	Study Type	Level	Scope	Outcomes/Results	Comments
Studies on organisational clinical performance						
(Shortell, Bennett et al. 1998)	Only 42 single –site and 13 multi-site studies in the literature	Systematic literature review	1	Evidence on clinical application of CQI.	Some evidence that quality & outcomes of care can be improved through CQI, particularly doctor participation, feedback, and supportive organisational culture.	Although positive results, very few studies and generally weak study designs.
(Irvine Doran, Baker et al. 2002)	25 teams in 2 tertiary and 2 community hospitals in Canada	Longitudinal random assignment to interventions	2a		Teams successful in improving clinical processes had greater skill in problem-solving, functional team interactions and doctor involvement on the team. Loss of CQI knowledge by teams over time. The cognitive and behavioural training intervention did not have a substantial impact in improving the performance of the teams.	
(Kossovsky, Chopard et al. 2002)	Department of Internal Medicine, Geneva University Hospitals, Switzerland	Pre-post cross-sectional comparison	4a		Quality improvement interventions were effective in changing 2 processes of care to reduce inappropriate hospital admissions.	
(Fraser, Wilson et al. 2002)	UK primary care group. Participants are chosen who work together to plan and implement the changes.	Case study	5a	6 to 12 month collaborative process developed by NHS – planning group addresses potential ways to improve chosen care.	Collaborative improvement approach associated with improvements in all aspects of anti-coagulant care.	Key concepts: • Working to own goals • Participation of doctor • Measurement • Small numbers at workshops enabled team members got to know each other.
(Lee, Choi et al. 2002)	67 Korean hospitals with 400 or more beds – 117 CQI staff members.	Cross-sectional by mailed survey	5a	Degree of CQI implementation measured by Baldrige National Quality Award Criteria.	Regression analysis found higher degrees of CQI implementation associated with: • Information systems • Use of more scientific CQI tools • Systemic problem solving approaches	Potential bias, as all respondents were responsible for CQI implementation.
(Grenier-	French hospital medical	Pre-post	6a	Retrospective and	Quality improvement methods provided 3 ways of	

Table 8 CQI and TQM

Quality Management, CQI and TQM						
Citation	Setting	Study Type	Level	Scope	Outcomes/Results	Comments
Sennelier, Lombard et al. 2002)	and rehabilitation care unit	comparison		prospective study of falls.	improving organisational processes to prevent falls: • identify organisational causes • develop methods to promote implementation • introduce vision of risk management.	
(Boerstler, Foster et al. 1996)	10 US hospitals	Case studies	6a	Site visits at hospitals with a range of experience with implementation of TQM (0- to more than 2 years).	Found six violations of conventional wisdom: • TQM can begin with clinical processes • Does not take years to show results • Strong senior leadership participation is not essential at the outset • Not necessary to begin with a clear visions of quality improvement • A Quality Council is not an essential first step • Not necessary to train everyone initially.	Difficult to involve doctors. TQM implementation hampered by lack of adequate information systems.
Studies on organisational change and innovation performance						
(McAdam, Armstrong et al. 1998)	15 Irish organisations with less than 100 employees	Cross-sectional	7a		Correlation between innovation and TOM. Organisations that scored highly on innovation and TQ built an innovative culture on established program of continuous improvement.	
Studies on organisational productivity, market share and financial performance						
(Davis and Fisher 2002)	21 Australian public and private sector organisations (transport, communications, IT and utilities)	Cross-sectional by survey	7a	All organisations had a formal quality program.	Middle managers had a strong belief that the TQM approach was an effective way to manage an organisation. Effective involvement of middle managers is important for the success of the quality program.	50% response rate. Similar results to HUY (Structure table)
(Hansson and Eriksson 2002)	Swedish companies	Pre-post comparison	7a	Compared financial performance of 17 Swedish companies that had won a quality award with indices and competitors.	No difference in performance during period of implementation of TQM. During post-implementation period award winners outperformed competitors and branch indices on all studied indicators.	Competitors may have implemented TQM - unknown
(Sharma and Gadenne	Australian businesses in service, manufacturing	Cross-sectional by survey	7a		In service firms value chain integration, supplier quality cooperation, emphasis on overall quality	13% response rate

Table 8 CQI and TQM

Quality Management, CQI and TQM						
Citation	Setting	Study Type	Level	Scope	Outcomes/Results	Comments
2002)	and construction industries employing more than 16 people				and deficits reductions were positively associated with financial performance and perceived TQM performance.	
(Curkovic, Vickery et al. 2000)	57 first-tier suppliers to General Motors, Ford and Chrysler.	Cross-sectional by mailed survey	7a	10 quality-related action programs, 8 dimensions of quality performance, 6 measures of firm performance.	Found 2 paths to improved firm performance: product quality with superior performance on conformance to specifications and design quality dimensions; and relationship quality with superior customer responsiveness and service.	38% response rate. Results found for suppliers.
(Dow, Samson et al. 1999)	Australian manufacturers with more than 20 staff	Cross-sectional by survey	7a		Employee commitment, shared vision and customer focus combine for a positive correlation with quality outcomes.	17.5% response rate
(Terziovski and Dean 1998)	Member companies of the Australian Institute of Management	Cross-sectional by mailed survey	7a		Linking quality to strategic planning, employee knowledge and involvement and involving customers is positively associated with quality performance in services.	
Studies on team performance						
(Lemieux-Charles, Murray et al. 2002)	97 clinical teams in Canadian hospitals	Cross-sectional by mailed survey	5a	6 hospitals judged by experts as having made significant progressing in applying knowledge about QI and 6 randomly selected hospitals from others.	CQI/TQM associated with improved team effectiveness as judged by members and external raters, even though external raters and team members used different criteria to judge performance.	69% response rate

Table 8 CQI and TQM

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