chss
at Tunbridge Wells
UNIVERSITY OF KENT

SERVICE INNOVATIONS BACKGROUND RESEARCH RAPID REVIEWS

**SIBR$^3$**

# Report 6

A Review of Strategies to design an emergency and an elective care system

'What are the effective strategies that may be initiated to develop the design of (a) an elective and (b) an emergency care system, which can be identified in current health research literature?'

***T. Ojo, D.F. O'Neill***

**August 2002**

# A REVIEW OF STRATEGIES TO DESIGN AN EMERGENCY AND AN ELECTIVE CARE SYSTEM

**'What are the effective strategies that may be initiated to develop the design of (a) an elective and (b) an emergency care system, which can be identified in current health research literature?'**

## Contents



**This report should be read in conjunction with SIBR3 report 1 and 5**

## Executive Summary

This paper addresses the following research question:

***'What are the effective strategies that may be implemented to improve the design of (a) an elective and (b) an emergency care system which can be identified in current health research literature?'***

It is a report on currently available background research evidence relating to the effective strategies which may be implemented to improve the design of elective and emergency care systems.

Literature reviews were conducted in areas of healthcare restructuring and re-engineering, primary care structural change and funding.

Emergency and elective care systems are being redesigned in many health care systems. Various health care jurisdictions have employed different strategies in the reconfiguration of their emergency and elective services. The present problems encountered in health care delivery in the NHS thus makes it necessary to identify the effective strategies and factors responsible for the successful management of emergency and elective care and potential working models and configuration alternatives.

Effectiveness of the strategies is evaluated in terms of whether the intervention made a difference to the emergency care system's ability to meet needs without risk to other care processes including elective work.

Firstly, the report identified that health systems with low hospital bed utilisation appear to be characterised by a large range of ambulatory and intermediate care facilities and/or strict controls on hospital services and expenditures.

This was followed by an examination of re-engineering and restructuring initiatives applied to inpatient assessment processes which included the strategic use of clinical/care pathways and protocols in redesigning the care process for patient admissions. This provided a diagnosis-specific plan for the episode of care and the role of each member of a multidisciplinary team. Other key features are *pre-clerking, admission of patients on the day of surgery, quicker discharge after operation and follow-up care at home by a nurse, a whole systems approach to bed management (all the staff in the hospital taking responsibility for bed management)*. The interventions were successful in reducing the length of patient stay in hospital and creating more efficient utilisation of hospital resources and improving the satisfaction of patients and staff.

Secondly, the active collaboration of the hospital administration is seen to be critical to the success of all interventions. Computerised communications had beneficial effects and were shown to improve health care by offering better record keeping, increasing access to education resources and providing an opportunity for patients to be more active participants in their health care.

Thirdly, patients' perception of care received from nurse practitioners were found to be satisfactory and there were no measurable differences in health outcomes when compared with GP care, this has important implications for healthcare policy.

A move away from hospital dominated hierarchy towards a primary care based network is necessary in order to sustain efforts geared towards improving the delivery of emergency and elective care.

## 1. Introduction

This paper is a report on currently available background research evidence relating to the following questions:

'What are the effective strategies that may be implemented to improve the design of (a) an elective and (b) an emergency care system which can be identified in current health research literature?'

Emergency and elective care systems are being redesigned in many health care systems. Various health care jurisdictions have employed different strategies in the reconfiguration of their emergency and elective services.

This report (thus) aims to provide a short reference manual on the existing evidence relating to the redesign of elective and emergency services as seen from a wide range of perspectives and the common features of service redesign. These features are discussed with respect to restructuring, strategic reconfiguration, micro management, primary care structural change, funding and regulation as well as policy. The effectiveness of the strategies will also be examined in light of how the changes have taken place, how services are being provided in new organisations and the benefits to service users.

Aiken and Fagin (1997), in their report, *'Evaluating the Consequences of Hospital Restructuring'* stated, "It is astounding to observe how many hospitals have made major investments in organisational restructuring and work design in the absence of empirical evidence of the effectiveness of the initiatives, or their safety."

The present problems encountered in health care delivery in the NHS thus makes it necessary to identify the effective strategies and factors responsible for the successful management of emergency and elective care.

## 2. The Background Environment

Much of the research (covered by) SIBR3 review (report 1) suggests that elective surgery may be better carried out independent of urgent provision. It also identifies the core services needed to support day surgery all of which are included in an elective core service list and generally discusses issues of the most efficient and effective ways of delivering acute hospital care in the NHS, the quality of care and care delivery and potential working models and configuration alternatives.

## 3. Methods

### The research question

*'What are the effective strategies that may be initiated to develop the design of (a) an elective and (b) an emergency care system, which can be identified in current health research literature?'*

**Search Strategies**

The search strategy for the update review follows a limited version of the framework laid out in the CRD guidelines. The search was carried out through the use of: databases, hand searching, published and grey literature and electronic searches of various journals.
Different search strategies have been adopted depending on the category being examined. Where reviews by other authors are referred to, they are appropriately cited and referenced.

*Databases searched:*
MEDLINE
CINHAL
DARE
HTA
NHS Economic Evaluation database
National Electronic Library of Health
ZETOC (British Library's Electronic Table of Contents database)
AMED (Allied and Complementary Medicine)
EMBASE

*In addition the following web sites were examined for the following publications:*
Kings Fund
Cochrane Library
CRD Reports
Bandolier
Audit Commission
Department of Health - press releases, executive letters and circulars
Department of Health - R&D
Health Technology Assessment
NZHTA
National Electronic Library of Health
ZETOC (British Library's Electronic Table of Contents database)
www.idealibrary.com
www.pubmed.oupjournals.org
The Royal College of Surgeons of England
The Royal College of Nursing

*The following Journals were hand searched:*
Australian Health Review 1997 - 2002
British Medical Journal 1997 - 2002
Critical Public Health 1998 - 2002
Health Care Strategic Management
Health Policy 1997 - 2002
Health Policy and Planning 1997 -2002
Health Service Journal
International Journal of Health Services 1997 -2002

Journal of Health Services 1996 -2002
Journal of Public Health Medicine 1996 -2002
Medical Care 1997 -2002
New England Journal of Medicine 1997 -2002
Primary Care Management
International Journal Quality in Health Care 1996 -2002
The Lancet 1996 -2002
The Milbank Quarterly 1997 -2002
VFM Update

*Search terms:*

| | |
|---|---|
| Health Services | Innovations |
| Service Modification Strategy | Service Models |
| Emergency Service | Elective Care |
| Service Reconfiguration | Hospital Restructuring |
| Health care Funding | Hospital reform |
| Organisational Management | Effective Policy |
| Health care reform | |

Evaluation studies of the strategies used in reconfiguring or re-engineering emergency or elective care are few and therefore, studies dealing mainly with the provision and organisation of accident and emergency services (A&E) and overall hospital capacity management have been included in this review. Effectiveness of the strategies is evaluated in terms of

a. The impact of application on the provision of emergency and elective care. If the intervention made a difference to the emergency care system's ability to meet needs without risk to other care processes including elective work;
b. The degree of impact with respect to creation of coherent care pathways;
c. Their cost-effectiveness/ cost benefits where available as few studies reported cost information.

**4. Reconfiguration issues**:

In order to inform the development of a more complete approach to the co-ordination of emergency care provision in the U.K., the Department of Health (2001) conducted a rapid appraisal of research evidence on existing evidence on how best to deliver health care services using an integrated approach. The review was entitled, ' An assessment of the research evidence, ' the analysis of which is taken to be the best summary of reviewed literature with respect to this review and to which references are made later on in this report.

The Consultation Document on the Findings of The National Beds Inquiry (*Department of Health, 2000*) reported trends in acute hospitals within the last century for elective and emergency treatments requiring bed rest.
It was found that the number of NHS staffed hospital beds (for acute, general and maternity peaked around 1960 at about 250,000 beds and fell thereafter. Although hospital expenditure had risen steadily, staffed hospital beds

continued to fall. The number of beds per head of population for acute, general and maternity fell by over 2% per annum since 1980, however the decline has slowed. This apparent change in trend reflects a slow down in the reduction in available beds and bed use (as measured by bed days) across all age groups. There had been a long-term increase in acute and general admissions per head of the population (around 3.5% p.a.), along with an increased through put per bed and shortening of the average length of stay. They concluded that the overall use of hospital beds had fallen in spite of an increase in the number of hospital admissions because this had been more than off-set by the shift to day case treatments and reductions in lengths of stay. The main contributor to the growth in admissions over the last decade had been the increase in the number of patients receiving care as day cases and the increase in emergency admissions.

Since 1989 the rate of increase in admissions per head had fluctuated around 2% per annum, but everywhere the numbers of staffed acute hospital beds were still falling, driven mainly by reductions in lengths of stay and in some cases (including recently Scotland) also by reductions in standard admissions. Health systems with low hospital bed utilisation appeared to be characterised by a large range of ambulatory and intermediate care facilities and/or strict controls on hospital services and expenditures.

Harries J. (1995) examined some options for addressing different aspects of clinical care which responded to environmental influences and allowed different designs to meet quality, cost, access and revenue ‘design mix’ criteria. In listing reconfiguration options for acute emergency care, he listed the four variants as:

a. Trauma centres
b. Minor injuries unit (MIU)
c. Help lines
d. Primary care

The separation of elective from emergency acute care is difficult and potentially expensive, as elective surgery requires many of the same facilities as emergency surgery. A detailed report of core services needed to support emergency and urgent care, and elective-only inpatient services are discussed in another SIBR3 review (report 1).

The appraisal of evidence in the following report will therefore be presented under the following themes as identified in various sources of information.

I Restructuring
ii. Strategic reconfiguration
iii. Micro management
iv. Primary care structural change
v. Funding

'Reconfiguration of healthcare services' is seen as a process of change which involves a move away from hospital dominated hierarchy towards a primary

care based network which is seen as being more responsive to individuals and communities and also dependent on political and professional will. *(http://www.nuffieldtrust.org.uk/notes/state/state23.doc)*

The starting point in reconfiguration is the assessment of current and future requirements of the emergency and elective care system with relation to utilisation improvements and service expansion based on population growth. Smith (1999) has proposed 8 principles to apply to the reconfiguring of acute hospital services:

A. Each area with its own characteristics would need its own solutions;
B. Services should be delivered as close to home as possible;
C. A whole systems approach should be directed towards planning services;
D. Absence of single handed consultants;
E. Hospitals with small catchments should not provide all services;
F. Service provision should be optimal at all levels;
G. Research and evaluation must be encouraged;
H. Consulting the public on unavoidable trade-offs.

## ***i. RESTRUCTURING AND RE-ENGINEERING***

Sochalski J. et al (1997), studied key issues on hospital and workforce trends using US data with international comparisons and found that hospital systems internationally were undertaking very similar restructuring interventions, particularly ones aimed at reducing labour expenses resulting in changes in numbers and skill mix of nursing staff as well as the fundamental reorganising of clinical care at the inpatient unit level. The strategies employed included reductions in the overall number of full time equivalent employees and lowering the average compensation per employee by reducing the skill level of the workforce. The main strategy aimed at nursing was the substitution of assistant personnel for registered nurses due to a decline in hospital occupancy. It was argued however that the strategy held only where an overall reduction in hospital staff was necessary.

Locock L. (2001) defines NHS redesign as a search for a balance between: the incremental, negotiated and participative approach of Total Quality Management (TQM) and Continuous Quality Improvement (CQI), the radical, lateral vision of re-engineering and recognition of the human factors affecting change implementation.

Walston's study to examine the effect of re-engineering on the competitive cost position of hospitals was done based on primary data obtained from a 1996/1997 national survey of hospital restructuring and re-engineering sponsored by the American Hospital Association (Health Services Research 2000). Walston observed that the use of steering committees, project teams, codification of the change process if properly integrated and co-ordinated in hospitals was of much benefit in the process of re-engineering.

Hammer and Champy (1993) defined process re-engineering as, "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in quality, service, and speed." The concept has also been associated with cost- cutting strategies such as rightsizing, downsizing, restructuring, and transformations and more specifically defined as a strategic effort to renew and organisation's alignment and / or competitive position through the simultaneous restructuring of work process(es) and organisational design (Hall, Rosenthal and Wade 1993; Walston and Kimberley 1997).

Business Process Re-engineering (BPR) as defined in the report of the School of Health and Related Research, University of Sheffield (ScHARR) titled, '*Re-engineering at the Leicester Royal Infirmary- An independent Evaluation of Implementation and Impact' is* "an approach to organisational change promising dramatic improvements in business performance" (ScHARR 1999).

The Leicester Royal Infirmary (LRI) is one of the largest teaching hospitals in England, and at the time of the BPR initiative had an annual revenue budget of around £130 million with approximately 1,100 beds and 4,200 staff. It's activity includes approximately 103,000 inpatient episodes, 120,000 accident and emergency and 400,000 outpatient attendances each year. An unusual feature of the hospital is the relatively high proportion of emergency work undertaken, compared with elective or planned activity (for example, approximately 80% of inpatient cases are admitted as emergencies).

**Inpatient Assessment Processes:**
It was found that re-engineering speeded up the development of assessment units for admitting patients to LRI. There was already an assessment unit for medical patients which predated the re-engineering programme. However the mangers within the directorates of Medicine, A&E and Orthopaedic Trauma focused on redesigning processes of patient access and discharge from the Medical Assessment Unit. Paediatric and Surgical Assessment Units were also developed.

Care pathways and protocols were put to strategic use in redesigning the care process for patients admitted with musculo-skeletal injuries, elective ENT surgery and elective Gynaecology surgery.

Below are case studies in re-engineering at the LRI as described in the ScHARR report.

Minor injuries: A and E attendance's increased throughout the 1990's in line with national trends. Re-engineers attempted to improve the waiting times for patients in A and E by re-engineering the process of care for patients attending A and E with minor injuries with nurses at triage ordering x-rays and providing minor treatments for a restricted set of injuries subject to clinical protocol. Full implementation of a redesigned process proved difficult. *Data covering the period from 1995 to 1997 indicated that despite changes to the*

*patient process there was a considerable shortfall between the waiting time targets set by the re-engineers in 1995 and also actual waiting times in A&E. There was no evidence that changes to the process of care for patients with minor injuries reduced overall waiting times in A&E.*

Elective surgery within the specialty of ENT: LRI is the only hospital in the locality providing an ENT service and accounted for almost 30% of the hospital's elective workload. Reengineers and management consultants were keen to reduce the length of patient stay in hospital, and increase the activity of the specialty by redesigning the process of care for patients requiring routine elective procedures such as tonsillectomies and septoplasties.

According to the report, the intervention was the first attempt within the LRI re-engineering programme at re-engineering the process by which patients were admitted into the hospital for elective surgery and required a period of stay in hospital. It was also hoped that the patient process developed for ENT would offer a template of a re-engineered routine elective surgical service that could be used to 'roll-out' re-engineering across surgical specialties.

*The ENT project did eventually succeed in defining and implementing substantial changes to the patient process and redesign of the patient process contributed to a significantly shorter length of stay for patients. 98% of patients requiring routine elective surgery were admitted into hospital on the day of surgery. Even then the targets set by the re-engineers were far from being achieved, evidence of which was seen in the lack of change in pace of work, measured by patients per operating list compared with the period before re-engineering.*

Re-engineering elective surgery within the speciality of Gynaecology:
Within Gynaecology, elective services accounted for 60% of all admissions and similar to the ENT intervention discussed above, the in-patient intervention was designed to re-engineer the process by which gynaecology patients were admitted for surgery, discharged from hospital and cared for at home after elective surgery. The key features of the re-engineered care process were pre-clerking, admission of patients on the day of surgery, quicker discharge after operation and follow-up care at home by a nurse. The level of clinical support for the re-engineered process was a critical factor in the sustainability of the new care process.

*The intervention was successful in reducing the length of patient stay in hospital and creating more efficient utilisation of hospital resources. Also there were reported improvements in the satisfaction of patients and staff. The process is now an 'embedded' feature of the work process in the speciality of gynaecology at LRI.*

Similar restructuring initiatives were employed at the King's College Hospital NHS Trust. In the Clinical Governance Review, the Commission for Health Improvement reported that with access to services, the trust saw 81% of outpatients within 26 weeks of referral (Sept 2000) and patients with

suspected breast cancer within 2 weeks of referral. Eighty nine percent of patients were seen within 30 minutes of outpatient appointment time and there were no patients waiting over 18 months for an operation.

King's has a whole systems approach to bed management (all the staff in the hospital taking responsibility for bed management). As a consequence, no patient waits in A&E overnight. To manage the discharge of patients with sensitivity, discharge co-ordinators were employed who had a background in community nursing or social work.

Aiken L. and Fagin C.M. (1997), noted that hospital restructuring initiatives generally sought to reduce nurse staffing levels.

'Magnet Hospitals', (a term coined to denote a hospital's ability to attract and retain nurses), have organisational structures which been reported as more positive and successful models than others. It is suggested that they should be identified and that their organisational structures should be emulated in reconfiguring the delivery of care elsewhere. (Havens and Aiken 1999). The authors reported the recognition received by magnet hospitals in administering exceptional patient care, providing good nursing environments and demonstrating organisational attributes that enabled nurses to fully use their knowledge and expertise to provide high-quality patient care thus shaping systems to promote desired outcomes.

Evidence of system wide impacts from hospital re-engineering has not been found. A U.S. national survey of hospital re-engineering (ref. ----1996) sought to gauge the impact of changes in structure and process which had occurred in U.S. hospitals. The investigators found that although many hospitals reported reductions to their personnel and that registered nurse numbers were reducing through attrition and layoffs during the study period, the national picture did not support this, and in fact demonstrated that the ratio of nurses to patient in hospitals had increased.

Coping with the frequent and often unpredictable change, that is exemplified by health service reform, has a significant impact on health services staff and managers and has been found to contribute to feelings of confusion and uncertainty and to lowered staff morale (Van Eyk H., Baum F. and Houghton G. 2001).

Norrish B. and Rundall T. (2001), reviewed relevant literature to describe the restructuring –related changes frequently reported with respect to the work roles, workload and control over work of registered nurses. They found that after restructuring, nurses typically spent less time providing care and comfort measures for patients and more time doing care planning and administration, activities that many nurses found less rewarding than direct patient care and had potential to affect the quality of patient care. They then proposed three strategies to lessen the impact:

- establishing and maintaining a clear focus on the patients throughout the change process
- collaboration at all levels through involving staff and increasing the responsibility and accountability of individuals
- frequent evaluation of the effects of changes on patients and employees.

In another study to assess the effectiveness of nurse practitioners in minor injury units, Sakr M. et al (1999), found that properly trained accident and emergency nurse practitioners who worked within agreed guidelines could provide care for patients with minor injuries that is equal or in some ways better than that provided by junior doctors (Lancet 1999; 354: 1321-26).

As re-engineering is process redesign, it may include changes in work assignments, modifications in clinical staffing and skill mix, and reductions in management positions. The objective of re-engineering is mainly to achieve higher levels of labour productivity and efficiency; thus enabling hospitals to deliver care at lower costs without decreasing patients satisfaction and the quality of care. Patient satisfaction is important in the U.S. context: because most communities have excess acute hospital capacity, garnering a substantial share of hospital admissions is essential for financial survival.

One of the studies done which demonstrated the impact of re-engineering on improving the quality of care through major staffing and functional changes was carried out by Wenban et al. (1999). They found that with firm commitment from hospital management, adequate resourcing and the appointment of committed, senior clinicians to drive the change process, that struggling emergency departments could be dramatically improved. Strategies employed include establishment of a chair in emergency medicine, increase in specialist staff, increased complement of registrars and a lesser increase in the total number of junior staff, reorganisation of nursing roles, use staffing of clerical liaison officers working weekdays, minor refurbishments and commencement of educational and research activities.

Since hospital reengineering differs in certain aspects between institutions, different strategies are usually adopted though, several core strategies have characteristic features which have already been discussed. One of such features is the decentralisation of allied health (e.g. physiotherapy) and ancillary personnel (e.g. housekeeping) to patient units. Another is cross-training of unit- based workers with varying educational backgrounds and expertise to take on tasks traditionally outside of their scope of work-blending e.g. house-keeping tasks with some direct patient contact. A team is thus created, which in theory is more efficient because workers can be substituted for each other. Patient satisfaction might be enhanced by having a wider range of unit-based services and personnel, thus giving rise to the re-engineering label "patient-focused" care.

### *ii. STRATEGIC RECONFIGURATION*

The completion of the first stage of the Local Modernisation Reviews (LMRs) saw the introduction of a booked admissions system for secondary care, an innovative appointment system that has improved access to GPs and refurbishment of operating theatres and recovery rooms in Bedfordshire. In Northumberland, a strong information and communications strategy was adopted which involved connection of all GPs to NHSnet and the introduction of NHS Direct to improve access to NHS Dentistry.

Other such innovations include the setting up of a trust helpline at Moorfields Eye Hospital NHS Trust which provides reassurance and information for patients from Moorfields and other health services around the U.K. and also receives referrals from NHS Direct, the provision of a touch screen which explained eye conditions and treatments in a clear and user friendly way and the development of telemedicine to improve access for patients to specialists. The CHI (Commission for Health Improvement) found that this model of care provided by the trust linked primary, secondary and tertiary care and also delivered at a local community level thus providing clinical networks that might have relevance beyond opthamology.

The Department of Health and Children, Ireland have adopted the following strategies to reduce the need for hospital beds

- Reduction inappropriate days of stay in acute hospitals: appropriate days of stay in acute hospitals may be due to beds lost in the course of treatment due to cancellation of investigations/ procedures or inefficient co-ordination of required medical and allied health professional services; or bed days lost to delayed discharge, i.e. the inability to discharge patients who have completed their acute medical care and who could be discharged to more appropriate forms of care. These included appropriate placements and/or community services for elderly patients, rehabilitation facilities for selected patients of all ages and specific facilities for disabled and young chronic sick patients.
- Use of capacity in hospitals with average occupancy less than 85%: the issues considered included measurement of available capacity, patient transfer, distance to travel and speciality issues which made it less it than feasible to utilise that capacity.
- Substitution of Elective Inpatient Surgery with Day Surgery: This is by increasing the number of procedures undertaken as day cases. Of elective patients treated in publicly-funded hospitals in 2000, 68% were treated as day cases with evidence of growth being as a result of new techniques and technology rather than substitution for patient work. 78% of elective medical patients and 50% of elective surgical patients were treated on a day basis.
- Improved Management of Private Beds in Public Hospitals: 80% of beds in acute hospitals were designated as public and 20% as private. It was noted that treatment of elective private patients in public hospitals was contributing to extended waiting times for some public patients approximately 160 beds were then made available for use by elective public patients by strict adherence to the 80/20 ratio of public/private beds.

Similar strategies were adopted by a group of researchers who conducted a study on the clinical effects of re-engineering the processes associated with elective surgery on patients attending the Prince of Wales Hospital, Sydney. *Admissions* were co-ordinated by the peri-operative unit, which sent out and received and reviewed patients' self-reported health questionnaires, and arranged pre-admission assessment, when indicated. Patients were admitted to peri-operative unit on day of surgery. After surgery, day-only patients returned to peri-operative unit, others to the ward.

*Patient information* was specific for each operation distributed by the surgeon. Nurses reinforced patients' knowledge
*Clinical pathways* followed. These provided a diagnosis-specific plan for the episode of care and the role of each member of the multidisciplinary team
*Post-acute care* continued at home after discharge.
The study had the active collaboration of the hospital administration, and hospital policy was revised at the start of the treatment phase to require all elective surgery patients to be admitted through the Perioperative Unit. The surgeons and operating theatre location and organisation were unchanged, although junior medical staff were rotated. There was no change in antibiotic prophylaxis or hospital infection control policies, thereby minimising any differences in enrolment patterns and other factors between the two arms of the trial.

Patients having elective surgery after a re-engineered system of co-ordinated care for elective surgery was introduced were found to have shorter hospital stays, lower risks of wound infection and reported higher levels of satisfaction. The patient satisfaction survey suggested that patients were more satisfied with a shorter length of stay combined with the appropriate support after hospital discharge. Although there were improved health outcomes and patient satisfaction, the researchers were careful to state that it did not mean that any reduction in length of stay resulted in improved outcomes, but that reduced in-hospital support could be replaced with carefully planned and supervised preadmission assessment, education and postdischarge care, without detriment to the quality of patient care (Caplan et al. 1998).

In a systematic review of eighty-three papers on randomised controlled trials on the use of electronic communications, measurement of the effectiveness in terms of process or outcomes of patient care, Balas E. et al (1997), found that:

- Computerised communications (telephones and modems to fax machines and video conferencing) had beneficial effects and could improve health care by offering better record keeping, increasing access to education resources and providing an opportunity for patients to be more active participants in their health care;
- Telephone follow-up and counselling consisting of live and interactive clinician-initiated telephone contact with questions, answers and recommendation about lifestyle, prevention of complications,

medications, and other aspects of self-management reported benefits after A and E visits;
- After-hours telephone access for patients could reduce hospital use and was a cost-effective approach to offering primary care consultative services.

### *iii. MICROMANAGEMENT*

Much of the research on micromanagement strategies used to reduce acute medical admissions have already been discussed in detail in another SIBR3 review (report 5) under the following headings: *primary care, hospital outpatient-based interventions to reduce admissions, emergency department interventions, emergency observation units, chest pain observation units, maximising bed utilisation, interventions to reduce acute medical admissions in the elderly and medication-related admissions, utilisation review to reduce inappropriate admissions and the use of guidelines/protocols/critical pathways/ treatment algorithms.*

Harries J. (1995) stated, “the development of management in the health service and the involvement of clinicians in management and the governance of their institutions has increased the willingness of health service employees to reconceptualise their role and to reinvent the wheel.”

### *Operational research strategies*

a. Spreadsheet modelling: The use of modelling techniques to reduce waiting times and cancelled operations proved effective in two trusts viz. Leicester General Hospital (LGH) and Preston Acute Hospitals trust (model used was similar to that of LGH).
Leicester General Hospital developed a model using a basic spreadsheet to assess ability in meeting contractual requirements with available beds and also implementing a bed-booking system to address the lack of co-ordination of admissions taking into consideration the bed days available, and bed occupancy with respect to the split between elective and emergency admissions. Before implementing the changes, consultant support was secured, staff involved in admissions were encouraged to inform the admissions manager of any patients not passing through the booking system and pre-clerking clinics were set up to assess patients before admission. The model was subsequently reviewed and repeatedly employed to assess the impact of appointing additional consultants, bed closures and changes in contract levels. Patients who cancelled operations were replaced with patients of the same sex needing the same procedure. Effectiveness was assessed through comparison of the outcome on the wards with predictions of the bed-booking sheets. From December 1993 to October 1996, maximum waiting times fell from 18 to 10 months.

b. Simulation modelling: Plymouth Hospitals NHS Trust, being faced with the dilemma of 'bed crisis', adopted computer simulation and optimisation models

whereby information service and decision making support in particular played a role in helping decision makers understand the potential impact of the proposed changes thus building a bridge between hospital managers and clinicians so that they could reach common agreements based on evidence rather than politics. The hospital was engaged in a process re-engineering project with the aim of improving the quality and efficiency of medical services in the face of increasing emergency admissions by taking the underlying measures:

- creation of a medical assessment unit;
- creation of a planned investigation unit, cardiology assessment beds, one-stop cardiology clinic, stroke unit;
- reduction of critical delays via the introduction of a progress chaser, improved social worker and community nurse liaison and also with the Community Trust. Improved ambulance and patient transport services and discharge planning;
- improved bed management : bed managers, better support for ward rounds, discharge lounge;
- re-organised medical on-take arrangements;
- revised bed and ward allocation plans.

Other Planning models:

Nolan T. et al, (1996) formalised learning experiences of hospital restructuring into a model for improvement (developed by the Institute for Healthcare Improvement) in health care organisations based on redesign of the system, shaping demand and matching demand to capacity. They believed that significant reductions in delays and waiting times were possible also, increasing access to care without adding staff or increasing costs was also possible through redesigning the system.

They identified 27 health organisations that worked to reduce delays and writing times and increase access to care based on the evidence that at least 50% of the total duration of most care processes consisted of waiting times. Many of the organisations met and exceeded their initial goal of 50% reduction in delays and waiting times while others still short of their goal, made substantial progress.

The Model for Improvement began with setting aims expressed in specific terms, establishing measures and developing changes based on a “trial-and-learning” approach to improvement. The changes were thus tested according to a plan -do- study and act cycle

In their study, they found that the York Health System’s 558-bed community teaching hospital began by examining the existing process and found that delays in transfer of patients from the Emergency Department occurred because there were no beds in available in the ICU thereby necessitating a move to free up beds in the ICU. An attempt was then made to improve the admission process and communication between the Emergency department and the surgical floors in order to reduce patient times.

In the end, the time needed to transfer Emergency Department patients to inpatient beds was reduced from 66 minutes to less than 30minutes – representing more than a 50% decrease.

Within the U.K., the cancer services collaborative aimed to implement change through and evidence based approach and was the first NHS programme to adopt the redesign model developed by the Institute for Healthcare Improvement. The collaborative is made up of nine cancer networks, in at least on English region covering a population of 14 million, and co-ordinated by the National Patients' Access team (a part of the NHS Modernisation Agency). In each network a programme director and a facilitator were funded, clinical leads to work with facilitators appointed and shared learning is encouraged with two day residential meetings every six months, a web based listserver, and regular teleconferences.

Though not designed as a randomised trial, the collaborative project teams applied the improvement methods to some patients and noted changes which were in line with the plan-do-study-act -methodology (4400 changes tested between September 1999 and August 2000 involving about 1000 patients).

Sixty five percent of projects reported at least 50% reduction in the time to first treatment for each of five tumour types, 56% of patients achieving booked admission for the first outpatient appointment, 56% for first diagnostic tests, and 62% for the first definitive treatment, improved patient flow and access (through direct referrals) thus reducing waiting times from an average of 24 days to 11. Other changes noted in the various networks include elimination of backlog of patients with suspected breast cancer as they were attended to in the next available clinic, elimination of separate visits for conditions requiring different procedures so that all procedures can be done on the same day, prompt notification of GPs of a diagnosis of cancer, taped consultations for patients future reference, presence of a pre-booking system which reduced waiting time for bowel biopsy results, introduction of an assessment by a palliative care nurse reducing delay in starting care, conformation of information given to patients to the plain English Campaign recommendations and more availability of beds.

The National Demonstration Hospitals Program (**NDHP**) in Australia is another example of an innovation based on a model that acknowledges that best practice occurs in the acute care sector and facilitates a sharing of information and expertise between hospitals. It also supports implementation and evaluation of systems and processes that improve quality and effectiveness of the services that hospitals provide (National Health Priorities and Quality Branch, Commonwealth Department of Health and Aged Care 2000).

The NDHP was funded under the Commonwealth Budget in 1993 with aim of reducing clinically inappropriate waiting times for elective surgery through the identification and dissemination of strategies to overcome barriers to improved

management of the whole elective surgery processes. The NDHP was in three phases:
NDHP 1 - Development and implementation models in elective surgery management - The first phase focused on the effective management of elective surgery. It ran from July 1995 through to June 1997 and funded projects relating to pre-admission assessment, operating theatre utilisation and discharge care planning. Phase 1 had seven lead hospitals and 32 collaborating hospitals across Australia. Consortia varied in size from four to seven including the lead hospital.
NDHP 2 - Integrated bed management. - Phase two focused on the improvements in integrated bed management. It ran for 12 months from July 1997. 29 hospitals participated in the second phase. It was developed in response to Phase One findings that many hospitals did not have systems in place to integrate the management of all admissions.
NDHP 3 - Integration of services across the acute and related areas of the health sector - Phase three projects commenced in June 1999 and ran for two years. Phase three identified innovative models that improve the quality, co-ordination and integration of all services provided in the hospitals. It included areas such as pre-admission, ambulatory, in-patient and post discharge services. A total of four lead hospitals and 20 collaborating hospitals participated in the program.
Summary of outcomes include:

- Estimated resource savings for participating hospitals ($90-$110m);
- Average length of stay reduced by 6% for the program overall and up to10% in 23% of NDHP hospitals;
- Day of surgery admissions for non same day cases up by 11.6% for the program, up 50% in 23% of hospitals;
- Operating room utilisation up 3.2% for the programme as a whole, 50% achieved 90% utilisation;
- Cancellations on planned day of surgery admissions reduced by 3.2% for the program as a whole, 28% of hospitals achieved a reduction of over 20%;
- unplanned, unbooked readmissions within a month of discharge reduced by 26% overall;
- case rates (patient/bed/month) increased by 6.3% for the program as a whole, 30% of hospitals improved their case rates by 10%

In general, there were substantial improvements in outcomes for patients and the overall quality and effectiveness of their bed management.

In the reorganisation of medical admission arrangements at Stobhill Hospital, Glasgow, a new system was developed which had the following features:

- a patient management team which handled administrative aspects of the patient's hospital stay and ensure that patients were speeded through the system and discharged home as early as possible;
- specialty transfer improvement whereby consultants visited the receiving wards daily to ensure the timely transfer of patients;
- a fast track service for laboratory investigations that ensured that time waiting for results was kept to a minimum.

This resulted in significant reductions in bed numbers and better management of increase medical emergencies, increased staff morale.

### *iv. PRIMARY CARE STRUCTURAL CHANGE*

Redesign is still a new activity in primary care, but developing. Redesign across the primary/secondary care interface can involve: direct booking, slot systems, alternatives to outpatients, discharge and intermediate care redesign. A well-known example is the use of General Practitioners in King's A and E Department.

The A and E Department is open 24 hours a day, 7 days a week and sees over 84,000 patients each year. Approximately 25% of the patients are under 16 and 15% over 65. Many of the patients who attend are not registered with a General Practitioner. There are three consultants, five specialist registrars ad a lecturer. There are sixteen Local Primary Care Practitioners (GPs) working sessions within the department and seeing patients that present with conditions best treated within the community. They offer up a service of up to 50 hours a week. A triage system is in operation and it has been estimated that 40% of patients have primary health care needs. Part of the triage process is to decide if the patient should see an A and E or Primary Care Doctor (GP) and is based on the Manchester Triage System.

The Accident and Emergency (A and E) primary care services project was developed at King's to investigate why patients used A and E for primary care and research the primary care role of GPs within an A and E setting and was found that it proved to be an effective means of reducing hospital interventions e.g. investigations, referrals and prescribing. Between December 2000 and May 2001,the Commission for Health Improvement (CHI) conducted a clinical governance review at King's College Hospital NHS Trust which commended the GP A&E Primary Care Service described it as an example of notable practice within the Trust and a service that contributed to reducing waiting times in A&E.

*Skill mix change*:
Little research evidence exists on the effectiveness of skill mix changes. The two conceptually different ways in which the skill mix of primary care teams in Britain is presently undergoing change are i. through delegation /substitution, task (s) formerly performed by one type or grade of professional are transferred to a different type or grade of professional and ii. Through diversification whereby the range of services provided within primary care is enhanced through recruitment e.g. Nurse Practitioners (Sibbald, 2000).

The Department of Health (2001) reported nurse practitioners (experienced primary care nurses who have completed and advanced education programme) increasingly used in providing care for patients requesting same day appointments. They found that even though consultations were longer,

patients perception of care received was satisfactory and there were no measurable differences in health outcomes when compared with GP care. Patients seen by Nurse Practitioners (NPs) were reported to have received more information about their health problem, management of symptoms and when to seek help, and also more likely to have screening done. Nurse to GP referrals were reported to be infrequent.

NHS reforms / policy changes (e.g. creation of primary care trusts and groups and discarding of fundholding) which encourage a shift from hospital -to - community-based care have been held largely responsible for skill-mix changes in Britain. The effects of changing skill mixes are a very challenging technological development to assess because of the need to examine the effects of change on the totality of health service delivery within a given clinical area. Effects may differ between healthcare systems. (Sibbald 2000). If the cost effectiveness of the NP is to be evaluated, it would need to be done based on their impact on the overall workload management practices. (Department of Health).

Leedham and Matthews (1997), identified *four* major groups of stakeholders as playing important roles in restructuring healthcare delivery. They were:

i. the community i.e. consumers and their advocates
ii. providers of services within the community
iii. administrators/managers/policy development
iv. political context

They described a process of stakeholder participation which focused on the reconciliation of all perspectives to achieve acceptable outcomes through:

- Listening and acknowledging the different opinions of different stakeholders. Providing feedback and ensuring understanding and correct interpretation of messages.
- Keeping staff informed of all the processes and possible impacts, listening to their views of how services may change. Involving, supporting, challenging and informing and being honest and also presenting both sides (recognising their concerns) good and bad.
- Relating financial resources to true demand. They recognised that in reviewing the needs of the community and the ways they can be effectively and efficiently provided that not all needs may be met.
- Developing a good rapport with the media. Giving information, being objective and acting as a resource to the media.
- Recognising the lobbying that will occur at the political level. Different agendas, different natures.
- Importance of having a decision so as to progress.
- Reviewing where you are = Reality check
- Likelihood of compromise
- Planning in advance

Community leadership is seen to be the platform for local strategic partnerships and success is being judged based on the extent to which local stakeholders are encouraged invest in local relationship development. Primary care is also deemed as being vital in this process as effective service delivery is dependent on people relationships and on effective

communication. Thus sustaining the important people relationships between staff and users, communities and managers and politicians and strategists is a complex process, and is influenced as much by local culture as it is by government policy (Manchester Business School, 2001).

Examples on primary care restructuring are described in this excerpt taken from the Manchester Business School's report on ***'The future - primary care in the community'.***

***Primary Care Groups were established in 1999 and covered all GP practices in England. Their key tasks were to:***

- ***reduce health inequalities in the local community***
- ***develop primary and community services***
- ***develop the commissioning of secondary services.***

***The three PCGs we include in this document are Trafford South, Oldham East and Blackburn with Darwen. The following sections outline their change strategies and the barriers they encountered when attempting to involve GPs, staff and communities in their planning and service development.***

***South Trafford PCG change strategy***
***The PCG's strategy was to:***

- ***involve staff in all planning and monitoring work on routine basis***
- ***enable a personal and direct approach with staff because it was a small agency***
- ***enable staff to be released from their routine duties to contribute to service change***
- ***develop a Learning and Teaching Trust to provide professional development for staff – this is now registered and is one of three in the UK***
- ***aim to build confidence amongst staff by talking about long-standing problems and resolving them.***

***The PCG had some positive drivers for change. Trafford Local Authority was also undergoing rapid change and its officers and politicians were keen to work with primary care. The local authority had a chief officer and leader who had a strong focus on staff learning and a desire to fund new ways of working. The PCG held events where professionals from various organisations, including universities, could share thinking and reflections. In particular the 'older peoples' work was welcomed, because all stakeholders could map the whole context and therefore understand relationships, gaps and resources within the whole economy.***

***Blackburn with Darwen PCG change strategy***
***The strategy of the PCG was to:***

- ***deliver multi-professional teams in GPs in localities matched to neighbourhood local authority divides***
- ***deliver a balance between private and public care***
- ***provide IT and admin support for single-handed GPs***
- ***manage the loss of nurse managers given that some senior managers were blocking change***
- ***achieve flatter and better communication between staff, local people and GPs.***

***Clinical governance provided the anchor for multi-disciplinary forum discussions on clinical practice, standards and quality.***

***East Lancashire is conservative and the PCG had some cultural obstacles to face. Despite valiant efforts in the past by some GP fund-holders, the health system was not responsive to the community's need for service variations. The community trust was slow to engage with the PCG. Lengthy discussions were required to determine what services could transfer to the new organisation and what would need to remain so as not to jeopardise service to other PCGs. The management style within the Community Trust was very centralist. Community nursing staff were managed arbitrarily by moving staff about the locality. Staff were not encouraged to build teams and there was a lack***

***of continuity both for patients and GPs and their staff. Inevitably, middle managers felt threatened by the PCT. On the other hand, staff on the ground began to see the opportunities and become enthusiastic for the change. It was seen that the creation of a PCT would introduce integrated nursing teams working with large GP practices or with groups of practices. The PCT offered GP practices and teams the opportunity to manage their own workloads and day-to-day pressures within agreed delegated budgets.***

***Oldham East PCG change strategy***
***The strategy is based on the concept of the learning organisation. The two Oldham PCGs had developed an Oldham Health Improvement Programme and worked to achieve change in a number of ways. They introduced:***
***- collective learning sets in four clinical areas - cancer, coronary heart disease, mental health services and respiratory disease***
***- a Beacon Practice, awarded for care for older people***
***- a joint health/social work facilitator to promote integrated working between general practices and social services***
***- a town-wide mental health project, to review the overall development of mental health services***
***- development funds to provide a bi-lingual communication and health advocacy service to health professionals and patients***
***- funds to reduce ophthalmology waiting times at the hospital.***
***The fact that there was no clear boundary division between local communities in Oldham made having two PCGs difficult. In addition:***
- ***links between GPs were not good***
- ***community and voluntary sector links were poor***
- ***collaborative links with the acute NHS sector had not been well developed by the health authority or by fund-holding GPs.***

***The Oldham East PCG strategy was based on an organisational development strategy which aimed to unite staff across general practices by providing 17 learning sets. These focused on service improvements and on clinical governance, and were self-directed and involved doctors, nursing staff and managers.***

The availability and growth of Minor Injury Units, NHS Walk-In Centres and Primary Care Emergency Centres many of which are located within A&E departments is seen to be of benefit in increasing access to health care providers (Department of Health, 2001).

### ***v. FUNDING***

Devolution of purchasing responsibility ranges from fee-for-service remuneration to capitated or block payments, (or beyond to direct payment to patients to purchase their own care) it occurs when a commissioner (purchaser) is funded to arrange and pay for access to services delivered by one or more provider(s), this results in a rationalisation of the decisions about what services to provide at a distance from the provider. Examples are seen in the 1991 and 1996 NHS reforms, in the 1992 New Zealand Health reforms, in the 1996 New South Wales Health reforms, in the various types of Health Maintenance Organisations (HMOs) and managed care organisations in the United States of America and in many other systems in the developed and developing world.

In the NHS devolution has involved infra-structures based on collections of GP practices holding mostly capitated budgets to purchase a variable range of care for their patients from acute trusts, community health and social services. From limited ‘fundholding’ there developed GP-led 'total purchasing 'pilots which were set up to purchase a comprehensive range of health services for their populations form a wide variety of providers and subsequently these have been replaced by Primary Care Trusts (Mays and Mulligan 1998, DoH 2001 [Changing the Balance of Care]).

Experience in New Zealand and the U.K. suggests that there are different routes towards 'full' integration (combing both service co-ordination and devolved purchasing) (Davies, 1999) while Australian studies on the effects of casemix funding on hospital utilisation in the Northern Territory and Victoria have shown positive impacts in terms of hospital output. It also indicated that efficiency in the provision of care had not been reduced nor was there decline in the quality of care (Xiao J. et al, 2000, Duckett 2000 - see Sibr3 rep 5 for ref)

## 6. Conclusion

As with all research, caution must be taken with the generalisability of the findings as extending the findings to all hospitals and other health care structures may not always be valid or desirable. Health care in the UK is an industry primarily made up of not for profit organisations (Walston, 2000). As hospitals become more business like, they may more closely resemble other types of organisations (Alexander and D'Aunno 1990; Shortell and Kaluzny 1994).

The evidence available appears to suggest that the effective strategies and factors responsible for the successful management of emergency and elective care are those centred around patient-focused care which involved a move away from hospital dominated hierarchy towards a primary care based network. Also important was overall clinical support for the re-configuration of services and the use of wider range of unit-based services and personnel. The recommendation is to conduct research that evaluate the cost-effectiveness of various strategies to distinguish those whereby emergency

and elective care can be delivered at minimal costs without decreasing patients' satisfaction and the quality of care.

As with other SIBR3 reviews, this is a rapid review of a broad area of health service activity with minimal published evidence. An attempt has been made to identify relevant issues from the scientific literature, the depth of detail in some areas may be less than in others. Where an area has been previously addressed in a review from this series the report in question is referred to. Previous reports are available on the CHSS web site or in hard copy from CHSS Oak Lodge David Salomon’s Estate, Broomhill Road Tunbridge Wells TN3 0TG  Ph. 01892 515153.

**Bibliography**


1. Ackoff et al. (1998). *An Idealized Design of the US Healthcare System*. INTERACT, The Institute for Interactive Management.
2. Aiken L, Fagin CM. (1997). Evaluating the consequences of Hospital restructuring. Medical Care
3. Balas EA et al. Electronic Communications with Patients: Evaluation of Distance Medicine Technology. JAMA. 1997 (278: 152-159).
4. Bowns I, McNulty T. (1999). Reengineering at the Leicester royal Infirmary – An Independent Evaluation of Implementation and Impact. School of Health and Related Research, University of Sheffield
5. Davies P. (1999). Making sense of integrated care in New Zealand. .Australian Health Review. 22 (4)
6. *Future Direction of the Healthcare System - establishing district health authorities*. Department of Health, Nova Scotia. 1999.
7. Finding a better way to manage emergency admissions: Reorganising the medical admission arrangements at Stobhill Hospital, Glasgow. Bandolier Jan 2000; 5-3. http://www.jr2.ox.ac.uk/bandolier/ImpAct/imp05/i5-3.html.
8. Harries J. (1995). Reconfiguring the District General Hospital. Primary Care Management. 5 (7): 9-11
9. Havens DS, Aiken LH. (1999). Shaping systems to promote desired outcomes: The magnet hospital model. Journal of Nursing Administration, 29(2): 14-20
10. Kerr D, et al. Redesigning cancer care. BMJ 2002; 324:164-166.
11. King's, Lewisham and St. Thomas' A&E Primary Care Service.
12. Kipping et al. *( Booking patients for Hospital Care: A progress report. Health Services Management Centre. spp3.bham.ac.uk/hsmc/report/2ndBkdAdSum.pdf*
13. Leedham P. and Matthews N. 1997 How do we change service delivery in a rural community. http://www.ruralhealth.org.au/pdf/program.pdf
14. *Making winter monies work*. Department of Health. 1998 www.doh.gov.uk/research/wmro/reports/winter.htm
15. Manchester Business School (2001). Protecting Innovation in Primary Care. The future - primary care in the community.
16. Modernising the NHS in Trent Local Modernisation Reviews. http://www.doh.gov.uk/nhsperformance/modreview/index.htm
17. Morgan C, Vaughan L. (1997). Bed spreads. Health Service Journal (11: 28-29)
18. Nolan T, Schall M, et al. Reducing Delays and Waiting Times Throughout the Healthcare System. Institute for Healthcare Improvement . 1996.
19. Sakr M. et al. (1999). Care of minor injuries by emergency nurse practitioners or junior doctors: a randomised controlled trial. The Lancet (354: 1321-26).
20. Sibbald B. (2000). Inter-disciplinary working in British primary care teams: a threat to the cost-effectiveness of care? Critical Public Health 10 (4) :439 – 451.
21. Sochalski J, et al. (1997) Hospital restructuring in the United States, Canada, and Western Europe: An outcomes research agenda. Medical Care.

22. The Leicester, Leicestershire & Rutland Health Improvement and Modernisation Plan 2001-2004. November 2001. www.leics-ha.org.uk/himp/Contents10.htm
23. Walston S. (2000). Does re-engineering really work ? An examination of the context and outcomes of hospital re-engineering initiatives. Health Services Research, American College of Healthcare Executives.
24. Wenban J, Carr J, O'Keefe S, Martin PJ. (1999). Re-Engineering an Australian Emergency Department: Can We Measure Success?, Journal of Quality in Clinical Practice, 19 (3):133 - 138
25. Xiao-Ming Huang. (1998). Decision making support in reshaping hospital medical services. Health Care Management Science 1 (165-173).
26. http://www.creative-healthcare.com/articles/solutions_UK.php3
27. http://www.doh.gov.uk/nationalbeds1.htm
28. http://www.acen-cjonl.org/14-1/restructure.html
29. http://www.health.gov.au/g8/summary.pdf
30. http://www.ruralhealth.org.au/pdf/service.pdf
31. http://www.wsufftrust.org.uk/ModernisationDocs/Presentations/Louise%20Locock_files/frame.htm
32. http://www.northumberland-haz.org.uk/haz4/LIS2001/Northumberland-LIS.pdf
33. http://www.nhs.uk/nhsmagazine/archive/aug/feat9.asp
34. http://www.chi.nhs.uk/eng/organisations/london/moorfields/2002/qa.shtml