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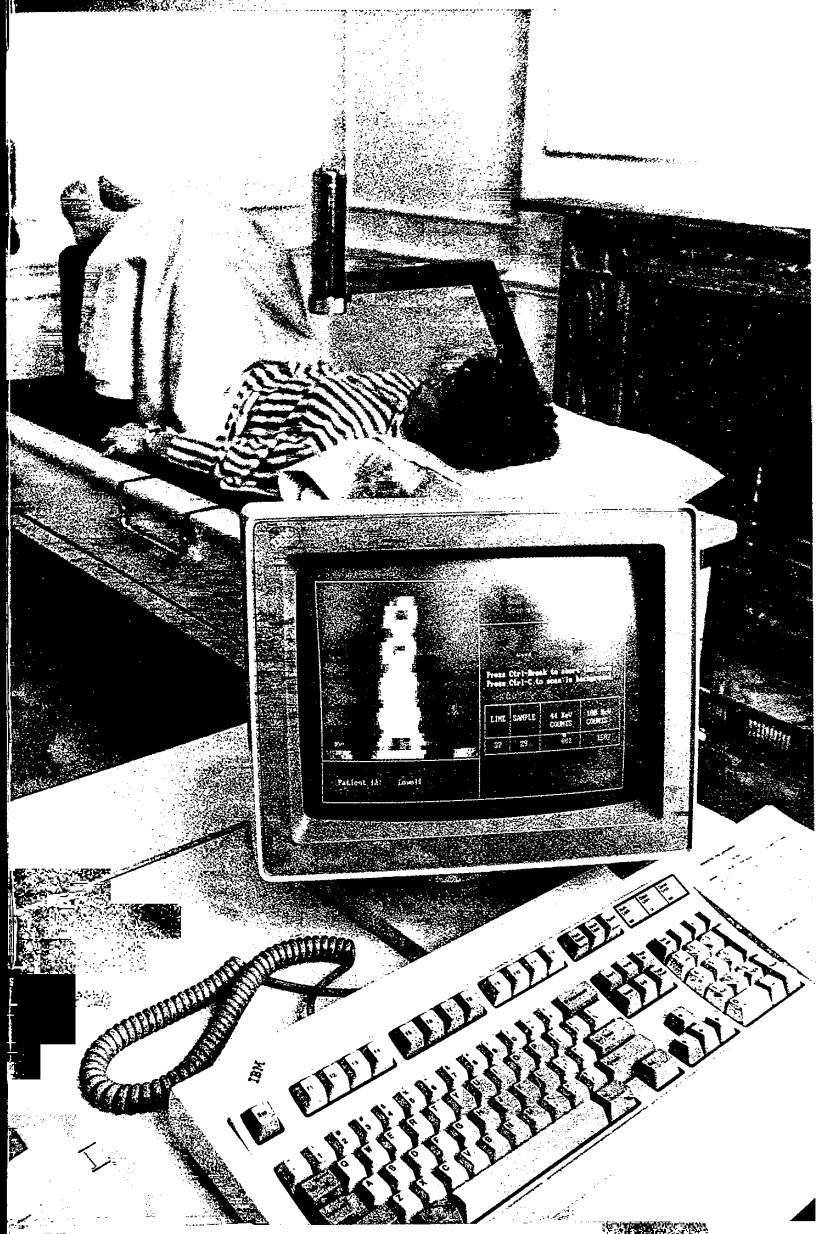

The future shape of acute services

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Barbara Stocking

King's Fund Centre

for the King's Fund Commission
on the Future of Acute Services in London

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EXECUTIVE SUMMARY

The hospital is a familiar idea to us all. Yet there are societal trends and specific medical advances which are allowing acute care to move from hospitals to other settings. These are requiring us to rethink the purposes and functioning of hospitals.

Not all the trends are pushing in the same direction, though. Better housing conditions make home a safer environment for treatment and recovery. However, there is an increasing number of elderly people in the population and they are the major users of acute services. While technological developments are allowing patients to move out of hospitals much faster, at the same time these patients may require longer to recover phsyically and psychologically than they would have done when younger.

Patients' and the public's views are also complex. People often do not want to be in hospital yet they are concerned when beds are reduced or hospitals closed.

The medical advances described in this paper include:

- minimally invasive diagnosis and treatment, allowing much more day care and short stay work;
- increasing complexity of care in some areas, for example in cancer treatment;
- developments in biotechnology allowing much more near patient testing, and genetic diagnosis and gene therapy.

The implications for health care organisation and for the skills and training of the different professions involved are discussed.

Professionals and managers have responded to these developments with a wide range of experimentation in care delivery, including much more acute care in the home, and the development of intermediate care, for example in hotels and in nursing bed units.

Some underlying themes emerge from the medical advances and health care delivery experiments. It seems likely that there will be much more patient control over their treatment in future, in part because more of it will take place in their homes or familiar community surroundings. There is a significant movement away from people having to stay in acute hospital beds for their treatment. Where there is a case for care in the acute setting it is likely to be for complex problems and where highly specialised personnel and facilities are needed.

There is no simple blueprint for the hospital of the future, nor a prescription for what will be done in the community or in primary care

in the future. There will be a need for much experimentation. What is argued, though, is that this should be a managed process so that there is an overall shape to the development of acute care rather than just reactions to particular developments in isolation.

Abbreviations

CT	computed tomography
DHA	district health authority
DNA	deoxyribonucleic acid (genetic material)
ECG	electrocardiogram
IT	information technology
MRI	magnetic resonance imaging
WHO	World Health Organisation

CHAPTER 1

Introduction

The idea of a hospital is familiar to us all and well understood. Because we have always known them, they have a sense of permanence in our communities. We have to think twice before we remember that it is a relatively recent phenomenon that most of us are born in hospital, a significant number of us die there, and that we expect to be in hospital when we are seriously ill. We need to remember that the purpose of the hospital originally was to provide an efficient arrangement to look after the poor sick, with others expecting to be cared for at home. Looking after sick people away from their overcrowded, damp and insanitary home conditions might have been the basis of hospital development, but of course, it has been added to in the twentieth century by the ability of medical care to make a difference to patient outcomes – mortality and quality of life – and the need to centralise the resources and facilities around this care in a hospital.

What we have not yet faced up to are the other trends which allow acute care to move from hospitals into other settings and which require us to rethink the purposes and functioning of hospitals. First, there is the great improvement in housing conditions, making home a much safer environment for treatment and recovery. This, though, has implications for informal carers, and not everyone, especially among elderly people, has someone at home to help look after them. Secondly, there is the significant demographic shift which has resulted in an increasing number of elderly people requiring health care (and suffering from chronic conditions, not the infectious diseases of the nineteenth century) and a decrease in the number of school leavers seeking employment in the NHS. These opposing pulls put great strain on the delivery of care as we know it. Thirdly, there have been important developments in medical technologies and procedures which allow care to be delivered in quite different ways.

While most of us recognise these features there is still the assumption that acute hospitals as we know them will continue pretty much the same. Though hospitals may be buffeted by all sorts of external forces, they seem resilient and bounce back once they have absorbed the particular impact. It is doubtful that this will be the case for much longer. Even if acute hospitals could withstand the various pressures, it is time to rethink and reshape them.

However, the forces do not all push in the same direction. There are paradoxes and dilemmas to be faced. For example, apart from maternity and child care, hospitals are filled with older people who, while not necessarily requiring specialised geriatric services, are

nevertheless slower in recovering psychologically and physically than they would have been twenty years earlier. On the other hand, health care technology has meant that operations and procedures can be undertaken safely with very early discharge. So the demographic force is to slow the pace down, while the technological one allows patients to pass through hospitals faster. How can these contradictory tendencies be resolved satisfactorily? They are certainly not reconciled at present, when patients and staff alike may be very concerned about discharging patients back into their own homes too quickly.

A second issue concerns the labour force: more and more people are requiring care, and fewer people are in the labour market to provide it. Does this result in poorer-quality care or a further reliance on community and family, or will technological developments mean that people can become much more responsible for their own care?

A third dilemma is about patients' preferences. In general, patients would like the best care possible, but as convenient to them as possible. Often, but not always, they would prefer to be at home. Yet the need for high standards in care means that further centralisation is likely. How can integrated, high-quality services be provided while improving access and convenience?

Because of these contradictions and dilemmas a simple picture of the future of acute services cannot be painted. What happens will depend on a whole variety of influences, and not least the broader political and economic environment. What this working paper argues, though, is that the development of acute services should be a managed process, one in which they are positively reshaped and not just one in which each development is coped with in isolation.

The paper highlights some of the technological developments which have recently taken place, and those which are expected in the next few years. In each case it looks at the implications for the delivery of services. Finally, there is a section to pull together these trends to see how they add up, though not, I hope, producing too much of a "blueprint". For the technological developments the base of the resource material comes from the Dutch Steering Committee on Future Health Scenarios (1987), though it has been updated in specific areas.

CHAPTER 2

Medical advances

Less invasive diagnosis and treatment

Perhaps one of the more important changes currently taking place is in surgery. It is becoming possible to use less invasive techniques in place of open surgery. The technologies which are allowing this generalised change include:

- endoscopes, and associated instruments and tools, including lasers used in investigation and diagnosis, but also used for surgery with appropriate instruments attached;
- lasers, which may be linked to endoscopes or catheters, e.g. for the removal of plaque in coronary heart disease. A competitive technique in this example is angioplasty, where a balloon is inserted and inflated to clear coronary arteries. Both these technologies are competing with coronary artery bypass surgery. The use of lasers, however, is highly controversial, and questions are being raised about their effectiveness in many circumstances (Banta and Scholl, 1991);
- lithotripsy, for both kidney and gall stones: the lithotripter uses high-energy shock waves to shatter stones;
- drug treatments; for example, the development of cimetidine has resulted in a major decline in surgery for gastric ulcers, and more recently RU486 has been approved for pregnancy termination as an alternative to operative techniques.

For diagnostic purposes what the developments mean is that tubes (endoscopes and catheters) are able to look far inside the body. Sometimes this means that investigational surgery need not be done, and sometimes it means that other investigations (e.g. barium meals) are not needed. The major change, though, is in treatment. Because all sorts of attachments can be added to the tubes, in effect internal surgery can be done without opening up the patient. It is important to note that many of these procedures are done under radiological/ultrasound control, so that sites can be located very precisely and the procedures monitored. Box 2.1 lists some recent applications of minimally invasive surgery.

A less obvious but perhaps equally significant development is in anaesthesia. Much safer and short-acting anaesthesia has been important in the development of outpatient and day-case surgery.

Box 2.1

SOME RECENT APPLICATIONS OF MINIMALLY INVASIVE SURGERY

- **Laser treatment of bladder tumours**
- **Extracorporeal shock wave lithotripsy**
- **Percutaneous lithotripsy**
- **Laparoscopic treatment of endometriosis**
- **Laparoscopic removal of ovarian cysts**
- **Laparoscopic cholecystectomy**
- **Laparoscopic appendectomy**
- **Catheter treatment of coronary artery disease (to dilate strictures or to vaporise clots with a laser)**
- **Palliation of colon cancer by endoscopic intervention**
- **Treatment of upper gastrointestinal bleeding by endoscopic intervention**
- **Arthroscopic knee surgery (e.g. removal of a loose fragment or torn cartilage)**

Although only a few of these procedures are accepted as routine, they are all being used in European health care systems (Banta, 1991).

Implications

The most obvious implications are that many procedures which would previously have required a hospital stay can now be done on an

Box 2.2

DAY-CASE SURGERY

The Audit Commission's analysis shows that if all district health authorities (DHAs) performed day surgery consistently at readily achievable levels for each of twenty common procedures, an additional 186,000 patients could be treated annually without increased expenditure. And many other procedures are suitable for day surgery, offering the potential for 300,000 additional patients to be treated annually.

The barriers to change were identified as:

- **lack of information to assess current performance, estimate the potential, and monitor change;**
- **lack of specialist facilities;**
- **inappropriate and insufficient use of those facilities which exist;**
- **poor management and organisation of day-case units**
- **clinicians' preferences for more traditional approaches, often backed up by a belief that patients do not like day surgery;**
- **disincentives for managers to bring about change, particularly the fear that inpatient numbers will not be reduced, there will be more surgery overall, and they will lose control of costs, threatening their cash limits.**

Source: **Audit Commission, 1990**

outpatient or day-case basis. To do day surgery well requires very good organisational arrangements, including making clear to patients what is required of them, and reassurance on how they will be looked after subsequently if it becomes necessary. The Audit Commission's report on day surgery (Box 2.2) highlighted how much could be done yet how little is in fact practised in the UK (1990).

The second set of implications concerns the skills and type of medical staffing required. The fact that there are boundary disputes about who should control these technologies cannot be ignored. There is great variety in hospitals about whether endoscopy is done by physicians or surgeons. There is also dispute about whether radiologists or surgeons should control some of these procedures. In most hospitals there is probably a need to rationalise what is taking place, for example having a properly organised endoscopy suite rather than a whole set of specialists with individual facilities and routines. At national level, however, there is a need to look at the implications for numbers, particularly of general surgeons. It seems unlikely that any specialty or sub-specialty can now completely claim control of these technologies, but nevertheless there is a replication of skilled resources which cannot be maintained. There is likely to be a need for fewer general surgeons, and this should be planned.

Then there is the question of reskilling. A major reason why people, including doctors, continue with outmoded practices is that they are frightened of or unskilled in new areas. There is a need for a new philosophy in medicine promoting lifelong learning and equally a practical need for reskilling, perhaps using simulation techniques (rather like training aircraft pilots). Recognising the changes begs the question of whether consultants should be on shorter-term contracts rather than lifetime tenure.

Lastly, there are issues related to medical education, particularly undergraduate clinical teaching. Though not the only force, less invasive surgery is certainly one influence producing much shorter lengths of stay and concomitant difficulties in medical teaching. It is not impossible, and it could be argued that it is preferable, to teach students in outpatients and day-case units and in primary care settings, which are the services of the future. It does, however, require acceptance of the need for change, and once again considerable organisation.

Treatment complexity and specialisation

If some areas are becoming simpler, others are growing more complex – perhaps with some of them this may only be a phase before a new technology makes the whole thing simple again. In other words, as Lewis Thomas (1974) described so well, many technologies are only halfway technologies, keeping people alive longer but not providing the definitive treatment.

Cancer, a common enough condition, illustrates this increasing complexity well. Taking breast cancer as an example, a woman diagnosed as having breast cancer may be treated with a mixture of surgery, drug treatment, short- or long-term, and radiotherapy. What she gets at present may have much to do with where she lives, which

specialists are available there, and their priorities. It has been argued, including in one of the King's Fund's consensus conferences (1986), that what is needed is people who are specialists in breast cancer treatment and know the range of possibilities and the risks and benefits attached to them. Other cancers fall into this category. It may be that referral to specialist centres is needed, but once the treatment plan is decided patients can undergo the treatment more locally, perhaps following clinical protocols.

Trauma is another area where it is clear that specialist centres with access to a range of resources have better patient outcomes. This has been discussed by the Royal College of Surgeons (1988). There are still questions, though, about the mix of resources required in any location and the number of centres. Specialisation may also result for less complex procedures and treatments, because there is increasing evidence that there is a link between volume and outcome (Luft, 1980). These results point to increasing specialisation by focusing work on one or two people in a hospital, or by transferring it all to units which specialise in that procedure. This raises questions about access and convenience for patients, and concern about how boring professional work could become if there is little variety.

Artificial organs and transplantation

Organ transplantation is now household knowledge, but it is still advancing, as newer drugs to stop organ rejection become available. The possibilities include kidney, liver, heart, lungs, corneal and pancreatic cell transplantation. Most recently the controversial transplantation of brain cells has taken place. Fetal tissue is being transplanted in patients suffering from Parkinson's disease and Alzheimer's disease, but so far success is uncertain.

Artificial organs are also developing, most obviously in the use of kidney dialysis and hip and other joint replacement. The artificial heart has also been tried out. With the development of biocompatible materials and more understanding of physiological function, there is considerable potential in this area. When people think of artificial organs they tend to think either of equipment for replacement (kidney dialysis) or of physical items such as an artificial hip. However, replacement of physiological functioning may, as described below, be rather different in future, for example with microcomputer controls releasing drugs or natural products. Most obviously this is seen in diabetic control, which looked at another way is really the replacement of a function of the pancreas.

Work will continue to find new ways of improving or replacing organ function, but in the meantime there are no immediate signs of a decline in the need for transplantation surgeons or specialists in other areas of organ replacement.

Biotechnology

Biotechnology is an area of scientific development which is having a

Box 2.3

DIAGNOSTIC KITS AND MONOCLONAL ANTIBODIES

By 1986 a growing number of tests based on monoclonal antibodies were coming into widespread use, e.g. kits for diagnosis of pregnancy and ovulation. Hybritech, a subdivision of Eli Lilly, had sixteen diagnostic kits based on monoclonal antibodies on the market. In addition, monoclonal antibodies were available from many companies for specific research purposes. But the major impact in the future will be on the diagnostic laboratory. The immunoassay reagent market in Western Europe was estimated to be US$360 million in 1981 and expected to grow to US$600 million by 1990.

The ease of carrying out many of the tests makes it possible to do them in the clinic, or even in the home. Already kits for the diagnosis of pregnancy and ovulation based on monoclonal antibodies are being marketed directly to the public.

Source: **Steering Committee on Future Health Scenarios, 1988**

major effect on the delivery of care, but about which many people are ignorant. The understanding of human genetics and deoxyribonucleic acid (DNA) (genetic material) and the development of techniques to cut, splice and recombine DNA have implications for a number of areas.

Diagnostics

Biotechnology has enabled monoclonal antibodies to be produced. These are antibodies targeted specifically against one substance. They can be used to detect the presence of particular substances very precisely and very simply. They are already being used in a number of diagnostic tests, some of which (e.g. for pregnancy and ovulation) can already be purchased over the counter (Box 2.3). They will in future be used to measure hormones, for diagnosis of infectious diseases, including sexually transmitted diseases, and for cell and tissue identification (for example they have been targeted at cancer cells with radionuclides attached for imaging). Monoclonal antibodies are only one example of a range of so-called biosensors becoming available for diagnostic and monitoring purposes.

Monitoring

A related field is that of monitoring levels of particular substances so that they can be used as a trigger to action. Some may use monoclonal antibodies, but there may be other techniques such as enzyme reactions which may trigger the systems. The possibilities in the control of diabetes are shown in Box 2.4. In future many such "closed-loop" systems may be developed for particular conditions, both allowing better physiological control and also enabling treatment to take place safely and easily outside hospital.

Prevention and treatment

Biotechnology is allowing development of more specific drug, vaccine and hormone treatments. Some of the first substances to be produced in this way were human growth hormone and human insulin. Apart from just producing better replacements for substances already in use, genetic engineering techniques make possible a whole new range of drug and vaccine development. It becomes possible to produce drugs which are the natural products of the body, including hormones, neurotransmitters, etc.

Another treatment approach is to attach drugs to monoclonal antibodies and use them to target specific cells, for example, cancer cells. So far this approach has not been successful, but there is considerable research in this area and it may ultimately be a breakthrough in the treatment of solid tumour cancers.

Artificial blood products are another form of treatment. Some are based on biotechnology, such as the production of Factor VIII for haemophilia. Artificial blood cells are being developed using other biochemical approaches, e.g. the use of perfluorochemicals. But they may also be produced on a large scale using monoclonal techniques. A general trend is that over the next few years more and more blood products will be available to replace deficiencies, including the oxygen capacity of the blood. In time it may not be necessary to use blood from donors.

Box 2.4

HOME CARE FOR DIABETES

It is known that people with diabetes develop fewer complications if the level of their blood sugar is closely monitored and controlled. Until recently this required continual care by a professional. Technological advances, however, have made home care increasingly attractive.

The technology has two components. One is a simple method for regular home monitoring of blood glucose levels. The other is a continuous insulin infusion by a small electromechanical pump worn on a belt or carried in a pocket.

Several manufacturers sell portable devices or chemically treated test strips that the diabetic patient can use at home. Only a drop of blood is required; it can be produced by a fingerprick.

The use of home testing seems to be both beneficial and cost-effective. Improved treatment can prevent complications, and close monitoring by a health care professional is not required.

The insulin pump is not so clear, however. It has already found use in diabetic patients who could not achieve normal blood glucose levels by conventional injections of insulin. Otherwise the main advantage of the pump is that it is no longer necessary for the patient to inject insulin by needle multiple times a day. In addition the patient on the pump has great flexibility in his or her diet and fewer symptoms from excessive or insufficient insulin.

It is possible that biosensors will be developed that can automatically monitor blood sugar levels. In that case a closed-loop system could be developed in which a small computer automatically adjusted the level of insulin infusion. This would further improve quality of life.

Source: **Steering Committee on Future Health Scenarios, 1988**

Genetic diagnosis and therapy

The understanding of the human genome and the ability to make DNA probes to locate and identify particular genes mean that a whole range of genetic disorders can be screened for. In some cases it may be that carrier screening is needed before individuals consider having children; in other cases it is the fetus that will be screened. At present the focus is on conditions causing major disabilities (for example there is already a gene probe for cystic fibrosis), but over time it may be possible to screen for genetic susceptibility to more common diseases such as heart disease and cancer. This raises enormous questions – who will be entitled to screening: should it be everyone, so that they can control risk factors? Who will have rights to this information: should employers know, so that they do not expose susceptible individuals to known risks? DNA-based tests are also gaining recognition as a tool in the diagnosis and prognosis of cancer. In theory these tests might lead to much earlier detection and treatment of cancer.

Gene therapy means the insertion, modification or excision of genetic material. This is much more a possibility for the future than for now. At present work is directed more towards insertion therapy, e.g. for blood disorders such as sickle cell disease and thalassaemia in the individual. Modifying germ cells is much more futuristic and will raise major ethical issues.

Implications

Some diagnostic kits are already available to the public over the counter, and many more could be in the next few years. Speed of development may have more to do with the ethics of self-diagnosis

than technological capability. For example an HIV kit is available but has not been sold over the counter in the UK because of concerns about the lack of counselling and support available to people using the kit. The ability to self-diagnose simply and accurately has major implications for the way people view health services. People may feel more responsibility for their own health and certainly will not need to rely on health services for information about their own state of health. It is unclear what effect more knowledge will have on health services use; it may or may not affect the number of worried well appearing in doctors' surgeries, and it may or may not produce a greater number of people requiring treatment.

What the changes in diagnostic technology will mean, however, is that many tests will move from the pathology laboratory in the hospital to bedside and other near-patient testing (e.g. GP surgery). It may be that a district general hospital no longer needs a pathology laboratory but will move simple testing to the patient and use a distant expert laboratory for complex tests and/or setting quality-control standards. There are serious concerns, however, about quality control after these changes. Some new diagnostics may have greater specificity than ever before, but that is not true across the board. Some tests may be done in GPs' surgeries, but questions may arise about how to interpret the results (how sensitive and specific are the tests?) and about the reliability of the diagnostic procedure. Cost is another major concern. The use of individual kits (although if purchased by individuals this may not be a cost to the NHS) and testing at the bedside are likely to lead to significant cost increases for equipment and its maintenance.

The implications for better treatment are not so clear-cut. It may be that people just get better control of their condition and fewer side effects, which might be an advantage to health systems (for example better control of blood sugar should result in less need for treatment for diabetic retinopathy).

There is no obvious cause and effect, however. Where biotechnology may have major implications is if it allows conditions to be treated satisfactorily for which there is no treatment now (Alzheimer's disease), or for which treatment is complex and unsatisfactory (many cancers). These cannot be predicted but the technological developments need to be watched carefully.

The current possibilities for genetic diagnosis are already producing a need for much better genetics services, including counselling. This requires management. Decisions need to be made about whether the community services (GPs, midwives) are to be trained to have adequate knowledge about the more common conditions or whether genetics centres need to be built up.

Diagnostic imaging

In the 1970s and 1980s diagnostic imaging took a major leap forward with the advent of computed tomographic (CT) scanning, magnetic resonance imaging (MRI), and so on. The various approaches use different forms of signals – X-rays for CT, nuclear magnetic resonance

for MRI, and radioactive compounds for Positron Emission Tomography. What they all have in common, though, is the production of data in digital form which can be processed by a computer to form images. Such data can be transmitted by phone or other communication links.

The implications are that X-ray film could disappear from imaging departments, and that is already taking place in a number of sites around the world. Perhaps more significantly the ability to transmit data should mean that images taken in one place could be interpreted in another. The patient does not therefore have to go to a distant referral centre in order to have the benefit of their expertise. It may be that it becomes possible too for the computer to interpret the data.

At present then these technologies are to a large extent in place, but their potential is only starting to be realised. There are experiments in distant transmission of images, but that again will need to be managed. What does it mean about the skills required locally if they are only needed to control image production and not to interpret them?

Future technology

Much of the technological development described so far is either already in practice somewhere or will be in use before too long. Only under biotechnology were developments discussed which may or may not come about, but which in any event need a great deal more research. To be complete it is worth noting some other areas where basic research is developing and which may result in new forms of treatment. The most promising area is in neurosciences. There is a mushrooming of knowledge about how the brain works and the biological substances involved. This knowledge could in time allow the development of treatments which will cure or ameliorate particular conditions such as senile dementia, a variety of mental illnesses and perhaps even learning difficulties (mental handicap). Biotechnology will provide the techniques to make specific products, but it requires the knowledge being generated in the neurosciences.

Other fields may have breakthroughs because of basic and clinical research, for example in the treatment of some of the cancers and autoimmune diseases.

In these fields the issues for health services will depend on whether the treatments are simple or complex to administer – and that also includes the complexity of the diagnostic methods required – and on whether the treatments provide cure or amelioration, with still a great deal of care necessary. In other words, the need for health services may depend on whether they are "halfway" technologies or complete solutions. It is extremely difficult to predict which will reduce costs and which increase them. In theory much of the minimally invasive therapy should reduce costs, unless its relative simplicity opens the way for many more patients to be treated, as with lithotripsy. Considering, preventive measures, for example, an AIDS vaccine might reduce the cost of treatment but at the same time be very costly itself.

CHAPTER 3

Trends in service delivery

Health care nearer to the patient

Under a number of the earlier sections, developments which have a tendency to move care into the community or into the home have been described. They are summarised here, with some other developments included.

The individual's knowledge of health and health care interventions

Some of the diagnostic developments allowing individuals greater knowledge about their health without referral to professionals have been mentioned. Developments in information technology (IT) are also important here. Already the media are heavily engaged in passing on information – and opinions – about health and health care. However, so far there has not been a great use of home computers for health information purposes. It is possible to imagine in future the use of personal computers to provide information to individuals about their conditions by means of algorithms; whether this will be allowed by professionals is a separate issue.

Care, mainly nursing, in the home before, after and to avoid hospitalisation

Shorter lengths of stay mean that people are recovering at home from clinical episodes and treatments. At present the level of support they get is very variable and usually felt to be not enough. There are some places, though, where systems are being developed to allow much earlier discharge or no hospital care at all by providing a much greater amount of care, particularly nursing care, in the home. The Peterborough Hospital-at-Home scheme is the best known, but there are others with variations on this theme (Box 3.1). It seems that such schemes or other approaches to rehabilitation and recovery (see below) will be needed if there is to be less reliance on acute beds, which are widely accepted not to be most appropriate for such phases.

Advanced technology in the home

A rather different but related issue is the movement of sophisticated treatments into the home. These treatments include: various kinds of intravenous treatment – cancer chemotherapy and other drug treatment; parenteral nutrition etc.; renal and continuous ambulatory peritoneal dialysis; ventilator support for those with breathing

Box 3.1

HOSPITAL-AT-HOME SCHEMES

The most famous hospital-at-home scheme in the UK was set up in Peterborough over ten years ago. Twenty-four-hour nursing cover is available from community nursing services, with help from a bank of nurses and patients' aides. The aim is to treat at home patients who would otherwise occupy hospital beds. Medical responsibility rests with the GP. The majority of patients are elderly, suffering from stroke and cancer, and many are terminally ill. An associated scheme, the Peterborough Hip Fracture project, has achieved early discharge for selected orthopaedic patients.

The Peterborough scheme has been successful in treating severely ill and handicapped people at home. An evaluation carried out by the Medical Care Research Unit at the University of Sheffield Medical School in 1988 showed that while the scheme was often cheaper than acute hospital care, many of the patients on the scheme would not necessarily have been admitted to acute hospitals. Despite some ambiguity over cost-effectiveness, this scheme is highly valued by professionals, patients, and their families.

Source: **Marks, 1990**

problems; and monitoring devices such as twenty-four-hour electrocardiogram (ECG) recording, continuous electronic fetal monitoring and alarm systems for infants with a risk of sudden infant death syndrome.

The implications of having such technologies in the home are rather complex. Many of these treatments are clearly quite frightening for patients and very good support is needed. Some require highly specialist knowledge too. There is a question about whether these technologies are best managed by hospital outreach teams (as has been the case with kidney dialysis), by specialist teams in the community (e.g. the use of stoma care nurses), or by the primary care team. However arranged, there is a need for very good organisational arrangements and good co-ordination between specialist and generalist health professionals.

Technologies for daily living

Non-clinical advances being made in IT and communications industries make possible the replacement or enhancement of some physical functions and should improve the life of people with disabilities, especially elderly people. Examples are video and print-out communications for deaf people, micro-electronic alarm systems and the development of robots controlled by voice commands. The particular breakthroughs are in speech analysis and speech synthesis. The implications for acute care may not be immediately obvious, but they should improve the ability of elderly people to live at home.

A related field concerns the development of sophisticated neuro-

Box 3.2

OPERATION CATARACT

The major innovative feature of Operation Cataract was the use of a local hotel as a residential base for patients who would have their cataract surgery performed at Worthing Hospital, about half a mile away. Up to seventy hotel rooms were booked for patients, each of whom would spend five nights in the hotel, one night prior to their operation and four nights afterwards.

A team of nurses, ably assisted by voluntary helpers from the Women's Royal Voluntary Service, was outposted to the hotel from the hospital to provide a twenty-four-hour nursing and support service there. One of the hotel rooms was adapted into a temporary ophthalmic clinic, and a number of nursing stations were set up at strategic points. Otherwise, no alterations to the structure or the regime of the hotel took place, the objective being to have "hotel guests" rather than hospital patients staying there.

Patients were transferred by ambulance from the hotel to the hospital and surgery was carried out in the Ophthalmic Theatre under local anaesthetic. After a short period of recovery they returned to the hotel by ambulance.

The post-operative period in the hotel was a tremendous success for the patients. The vast majority recovered from their operation very quickly. Each day they were seen in the hotel clinic room, where a post-operative check was made. The emphasis during this post-operative period was on self-help, patients being responsible for their own medication, although nursing staff were always available to assist and advise.

An unanticipated bonus of the scheme was the spirit of companionship and caring which developed amongst the patients.

The scheme has been repeated over several years.

Source: **Worthing DHA, 1988**

Box 3.3

NURSING BEDS

In 1986 a sixteen-bed nursing unit was established in the Radcliffe Infirmary, Oxford, an acute general hospital. The criteria for referral to the "nursing beds" were:

- **the patient was occupying an acute hospital bed and was over the age of sixteen;**
- **the patient was medically stable, defined as not requiring daily medical intervention;**
- **the patient's major need was for professional nursing, and that nursing as a therapy would allow eventual discharge from the NHS bed;**
- **the appropriate medical consultant agreed to the referral.**

Patients referred from acute wards included those with fractured neck of femur, major abdominal surgery, stroke, varicose ulcers. Evaluation of the unit using a control group remaining in acute beds showed that satisfaction with care was higher for nursing unit patients, dependency scores of patients were lower on discharge, and average costs were lower in the nursing unit. Despite these findings the unit was closed in 1989.

Source: **Punton, 1989**

logical prostheses for vision, hearing, speech, incontinence and human movement. In general the field of prosthetics could become far more sophisticated, in part through understanding of the body/materials interface and in part through the linking of prostheses to the patient's own nervous system. Though many of these developments would be important for small groups of patients, the control of incontinence would clearly be a major advance in hospital services dealing with a large number of elderly people.

The new recovery

The new technological developments taking place alongside the demographic changes are producing a need for a new view of how and where patients recover. Many are, of course, just discharged earlier into the home with or without co-ordinated arrangements. Home, however, may not be appropriate for all people, and there are examples of many treatments where the patient may need a period for physical and psychological recovery outside the home, but preferably not in an acute bed. A number of such forms are being tried.

Hotel/hostel arrangements

Interest is developing in using hotels or hostels alongside hospitals where patients can recover after operations. The best-known UK scheme is Operation Cataract, carried out by Worthing DHA (Box 3.2).

Nursing bed units

Some community hospitals have experimented with beds placed under the control of nurses, including admission, discharge, and arrangements for medical cover. There has also been an experiment in Oxford where such a unit was run in an acute hospital (Box 3.3).

Other practical ways of developing this immediate care are known to be being tried; for example in Berlin a staffed rehabilitation flat in the community fulfils similar purposes. The need is there and in different places people will no doubt devise different organisational forms.

CHAPTER 4

The future: underlying themes

A number of themes emerge from this range of developments.

Movement away from the acute hospital bed

Having read about the various technological and service developments the man from Mars might well ask, what are acute services? In the UK acute services have usually been taken to mean the diagnosis and treatment which is beyond the capabilities and equipment of the primary care team in the community. Diagnosis and treatment includes a caring component, including currently the nursing care given to patients in acute beds "recovering", but not usually covering patients with continuing care needs. These understandings are breaking down. With new technologies much more diagnosis and treatment can be done in the community, or at least in day-case settings, with no need for acute beds. There is also a recognition that if people need nursing care, say in a recovery and rehabilitation phase, a traditional acute ward is not a good place for them to be. Finally, there is recognition that much "acute" illness is really an exacerbation or acute phase of a chronic condition.

The picture of the delivery of care then begins to turn upside down. Instead of the hospital being the main feature, primary and community care become the central focus and require access to a range of facilities.

The focus of the majority of what is now secondary care will be outpatient, day-case or very short (e.g. overnight) stay work. This requires major reorganisation. Much of the work may not need to be done in hospital; outpatient and day-case centres might be equally appropriate. Wherever they are, though, the services need much greater organisation. The facilities will need to be booked by particular specialists but commonly available to a variety of users, and patient booking will need to be more sophisticated. None of this is impossible but it is a long way from how most hospitals operate now.

One model would be that the local centre would be a highly organised outpatient/day-case treatment centre, with perhaps a few beds for common procedures and investigation requiring some stay. The focus would be on ambulatory care rather than on beds. Linked to this centre, or at least available in the locality, would be a variety of forms of care, for example hotels/hostels linked to the centre, nursing bed units providing a more home-like environment for recovery.

As well as this use of some central facility, a lot more of acute care will be delivered in a highly decentralised way. Some of it will be sophisticated technology but carried out in the home or GP's surgery.

Consultants from the local secondary care centre could also carry out outpatient sessions in health centres and/or come to primary care clinics to act as consultants to GPs (rather than having patients handed over to them).

Greater patient control

As noted, there are some areas where patients will be able to self-diagnose or monitor their own treatments. There is also a movement in health care to inform patients more about their conditions and allow them greater choice among the treatment options, especially where there are quite different outcomes and types of risks (e.g. the development of patient-interactive video systems by Wennberg in the US). Also the sheer numbers problem suggests that patients and their carers will need to take more control of their health care, with the professions becoming educators and enablers – a tall order in terms of training and cultural change! Since much more care will take place outside the daunting edifice of the hospital it is likely that patients will have a greater sense of power over their health and health care. However, it may require a great deal of education to make patients feel comfortable in these new roles, especially if they become the controllers, in their own homes, of quite complex equipment.

Centralisation of specialist services

Some conditions and treatments will require highly specialised facilities, including beds. Often this will be because a variety of advanced technologies will be necessary for one condition (e.g. trauma, some cancer treatments); sometimes it will be because the procedures needed even for an individual condition are highly specialised and relatively rare, or so that the best patient outcomes result from these specialists treating a significant volume of patients. A question this raises is how staff will feel about working in highly specialised centres. Who will want to work in these intensive settings with very sick patients or carry out one procedure only?

Will acute services really change?

While many of these trends are recognisable there is plenty of scope for choice in the ways individual hospitals or localities will move. This working paper has emphasised technological developments and their potential impacts. To manage the change process to produce new models of acute service delivery will require an immense amount of organisational development. At the moment it is unclear how well key people are facing up to the implications of acute service development, unclear how they will decide in which areas to make change (how will they decide what is efficient; what criteria will they use to select areas for change?), but above all it is unclear that the NHS has the organisational development skills to bring about this level of change in a way which continues to motivate staff and to reassure the public.

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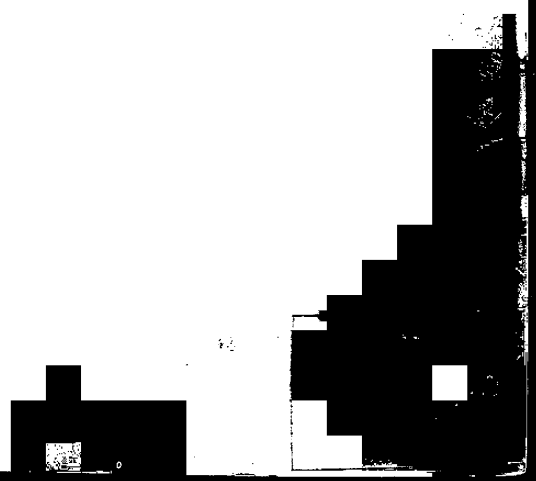
The King's Fund Commission on the Future of London's Acute Health Services' terms of reference require it to "develop a broad vision of the pattern of acute services that would make sense for London in the coming decade and the early years of the next century". With this in mind, the Fund's London Acute Services Initiative has undertaken a wide-ranging programme of research and information gathering on the Commission's behalf, of which this working paper represents one part.



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