

Access to Knowledge Helps Transform the United Kingdom's National Health Service for 21st-Century Patients

Executive Summary

CUSTOMER NAME

National Health Service
United Kingdom

INDUSTRY

Healthcare, Public Sector

BUSINESS CHALLENGES

- Support the need for accurate, timely knowledge in critical healthcare processes
- Improve access to clinical knowledge for all clinicians and patients
- Coordinate development and deployment of knowledge in a vast healthcare system

SOLUTIONS

- Deploy knowledge tools into the heart of healthcare processes
- Create a single virtual National Library for Health
- Develop national service for coordinated knowledge management across the NHS

BUSINESS RESULTS

- Better access to knowledge helps reduce U.K. breast cancer death rate
- Strategic importance of knowledge recognized in policies and innovations
- Knowledge becomes pervasive in care, with two million visits a month to the electronic library

Like many public healthcare systems, the United Kingdom's National Health Service (NHS) faces massive challenges to meet the needs of patients. It also has to organize the exponential growth of medical knowledge into a form healthcare workers can use to help patients. Having launched several knowledge-based initiatives within the last two decades, NHS plans to capitalize on them through improved coordination and new knowledge services.

Business Challenges

The [National Health Service](#) was founded in 1948 to deliver universal public healthcare based on clinical need and not on the ability to pay. Since that time, it has grown into Europe's largest organization, employing more than 1.2 million people across the United Kingdom. In primary care alone, the NHS conducts over a million consultations every day.

Like all public healthcare providers, the NHS must deal, simultaneously, with the fact that the needs and demands of patients are increasing faster than available resources, while the scale and complexity of clinical knowledge are rising exponentially. The causes of this rise are an explosion of medical research, ubiquitous use of the Internet, and, more recently, enhanced responsibilities for major NHS employee groups such as nurses.

There are said to be some 20,000 medical journals on the market, and it is estimated that if an average general practitioner in England were to print out the relevant medical knowledge made available to him or her in a year, the combined weight of paper would exceed 61 pounds (28 kilograms). One of the cornerstones of the organization's strategic response to the challenge, therefore, is to maximize the value obtained from safe and effective use of knowledge at every stage in a patient's journey through health and care.



Solutions

In the NHS, the pressure for greater efficiency and cost savings has combined with the ethical imperative of providing safer treatment and better patient care to generate a series of transformative, knowledge-based initiatives. These have been facilitated by digital technology and, increasingly, by a systems-based approach, often derived from advanced industrial models rather than established public-sector practices.

The [Cisco® Internet Business Solutions Group \(IBSG\)](#) has for a number of years supported major NHS knowledge initiatives. Two long-running programs—the National Cancer Screening Program and the National Library for Health—laid foundations for a National Knowledge Service; one of the first projects to receive its support was the Map of Medicine, combining clear clinical care pathways with access to up-to-date knowledge.

Sir J.A. Muir Gray, chief knowledge officer of the NHS, has been heavily involved in NHS knowledge-deployment for over two decades. He identifies a major shift in the ethos of healthcare for the 21st century: the physiological model of diagnosis and treatment—universal in Western medicine for more than 100 years—and the concomitant emergence of a set of well-defined specialties, are giving way to a patient-centered approach, with a clearer focus on presenting symptoms and a growing use of knowledge networks.

National Cancer Screening Program

In 1988, Sir Muir Gray set up a [national program for breast cancer screening](#). The disease is the most common type of cancer among women and, at that time, was killing more than 15,000 patients a year. Mammography was to be offered at three-year intervals to women aged 50 to 64, with a minimum target of 70 percent usage among those eligible. The screening was entrusted to a separate network of dedicated professionals working at fixed or mobile screening sites.

Crucially, this was one of the first projects to apply the “parallel knowledge network” approach that informs the present methodology across the NHS. “I have no formal bureaucratic power and no budget for screening programs,” says Sir Muir Gray, who remains in charge. “But, why do I need a budget when I have the knowledge, the standards, and the Website?”

National Library for Health

An electronic “library of libraries,” the [National Library for Health \(NLH\)](#) gives rapid access to specialist knowledge contained in 500 medical collections, physically scattered across the United Kingdom and previously accessible only by cumbersome, paper-based requests. Starting out in 1998 as the National Electronic Library for Health, the NLH is intended to resolve the paradox facing modern clinicians—confronted by more information than ever before, but ever less able to find what they need quickly.

“I have no formal bureaucratic power and no budget for the national antenatal screening program. But, why do I need a budget when I have the knowledge, the standards, and the Website?”

Sir J. A. Muir Gray
chief knowledge officer
National Health Service

The word “electronic” has been dropped from its title, reflecting the view that all libraries are on their way to becoming electronic. Dr. Ben Toth, former director of the National Knowledge Service, says: “The National Electronic Library for Health marked a step change in the ease and quality of information that was routinely available to clinicians in the NHS. Providing they had a browser, they could get at world-class information.”

National Knowledge Service

The [National Knowledge Service \(NKS\)](#) was set up in 2002 in the wake of the Bristol Inquiry—a public inquiry into a disturbing gap between parental awareness and the practices of the team responsible for child heart surgery at Bristol Royal Infirmary NHS hospital. Using the analogy of clean water, which was developed as a public utility in the 19th century, Sir Muir Gray sees a comparable role for knowledge in medicine today.

The NKS groups all medical knowledge networks in a structured framework. Each element has one or more initiatives attached at differing stages of development, amounting, in total, to about one dozen; but the ultimate objective is that all should be integrated to speed the fulfillment of NHS strategic aims. In the view of Sir Muir Gray, effective use of knowledge in the NHS entails five processes:

- **Procurement/production**—Contributes to the growth of knowledge through its own R&D and the [National Institute for Clinical Excellence \(NICE\)](#).
- **Organization**—Orchestrates through other knowledge-based initiatives, such as the National Library for Health and the Map of Medicine (see below).
- **Mobilization**—Uses the just-in-time approach of the industrial supply chain to make knowledge available at the point of clinical need, such as a general practitioner consultation.
- **Localization**—Provides lists of local pharmacies, for instance, and encourages user buy-in by controlled adaptation of centralized knowledge to local conditions.
- **Utilization**—The point where all of the above come together, enabling universal deployment of a consistent knowledge base throughout the NHS at all levels.

Map of Medicine

Developed at London's Royal Free Hospital and now owned by Informa plc, a leading publisher of specialist information to the academic, scientific, professional, and commercial communities, the Map of Medicine illustrates 1,200 standard treatment pathways. The diagrams are symptom-based, laid out in an easy-to-use flowchart format, and provide a ready but reliable visual guide to options for diagnosis and treatment based on what the medical profession terms "best current evidence." Parts of the map can be localized—for instance, to provide service information such as clinic opening times—but the core treatment pathways are tightly controlled from the editorial center.

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National Health Service

Business Results

Now affiliated with the National Knowledge Service, the breast-cancer screening project has demonstrated the value of knowledge in helping reduce death rates. By 2004, the U.K. mortality rate dropped by more than one-sixth to 12,417 since the program's inception. Extended to all patients up to age 70, the breast cancer screening project is now available on request to women past that anniversary. Screening programs have been in place for cancer of the cervix and, as of July 2006, of the bowel, while prostate cancer is monitored rather than screened. This increasingly extensive program is entirely underpinned by networked knowledge.

An early evaluation study on what has become the National Library for Health showed that an electronic library would save clinicians research time. In monetary terms, the savings then averaged US\$43 dollars (EURO€23) per online visit compared to traditional library facilities. The electronic library is now registering about two million user sessions per month, while surveys of specific services offered indicate that more than 70 percent of users have changed some aspect of their clinical practice as a result of material found there.

The roles of NHS librarians have also changed, says Dr. Toth. Whereas traditionally they would spend about a quarter of their time processing interlibrary loans, NHS librarians are now functioning more as information consultants and knowledge managers.

The library has launched an online primary care answering service, finding answers to 80 general practitioner questions a month and posting the results online for all to read. And with some nurses taking on the responsibility for procedures traditionally carried out by doctors, the NLH is attracting strong interest among the nursing community, thus facilitating the desired organizational change. For example, when one group of nurses began prescribing medications, 60 percent were found to be active NLH users—proof of its educational value.

The National Knowledge Service is embracing its role as strategic coordinator for knowledge-based NHS projects, and, increasingly, as guarantor of the quality and consistency of information held by each. In this way, it is becoming a genuine “utility,” spreading its influence throughout the service. “Knowledge is the enemy of disease,” says Sir Muir Gray. “The application of what we already know will have a bigger impact on health or disease than any drug or technology likely to be introduced in the next decade.”

The Map of Medicine is proving popular among clinicians, drawing strong interest from other health services abroad. By laying down standard pathways based on best clinical evidence, it is helping guarantee safer treatment for patients and fewer mistakes by staff, while providing a valuable baseline for further medical research and innovation.

Next Steps

Each individual project that shapes the evolving pattern of the use of knowledge across a large and complex organization is making an individual contribution. Yet there is a bigger prize: In combination with other resources, such as the multi-channel patient information and advice service, NHS Direct (a multichannel public health information system), and the forthcoming proactive health improvement service, Health Direct, the NHS hopes to engineer a profound shift in the balance of clinical decision making. Patient and clinician should become equal partners, making informed, adult choices on treatment or on the adoption of new habits for healthier living.

The cumulative result, senior NHS managers believe, will be major efficiencies, safer treatment, much needed cost savings, and—above all—improved patient care. “The patient is the only constant in every health consultation,” notes Sir Muir Gray. “We will see networks of clinicians bridging across not just primary and secondary care, but across six or eight hospitals to get sufficient expertise. The bureaucracy is there to manage the budget; now all complex health problems will be managed through more than one bureaucracy. So, in parallel, you have to set up knowledge networks.”

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