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Directly observed therapy for tuberculosis

Spend now or pay later

An American advertisement for engine oil filters says, "You can pay me now or you can pay me later!" This challenge might do equally well for directly observed therapy for tuberculosis. With the oil filter, buyers are weighing the cost of routine preventive oil filtering against the cost of eventually overhauling the engine because of lack of maintenance. With tuberculosis, the balance is between the costs of routine monitoring to ensure that treatment is completed versus the enormous expense of poor adherence, treatment failure, recurrent hospitalisation, drug resistance, and continuing transmission of infection.

Directly observed therapy refers to the process whereby a health care worker or trained lay person watches while a patient swallows anti-tuberculous drugs over the six to nine months of treatment. The drugs can be administered in daily or intermittent (two to three times a week) regimens in a wide range of clinical settings or at home, work, school, or any convenient designated area.[1]

Directly observed therapy for tuberculosis has its origins in the late 1940s and early 1950s, when British researchers used it in trials of chemotherapy in Africa, Asia, and London.[2] In the United States, despite the arguments of Sbarbaro and others that all patients should receive supervised therapy,[2] self administration was standard practice except for patients predicted to be unreliable.[2,3] Even when used only sparingly, directly observed therapy was successful in widely dispersed urban and rural areas in Denver, Mississippi, Texas, and Baltimore where it resulted in reductions in overall rates of tuberculosis, primary and acquired resistance, and relapse at a time when rates were rising nationally.[2,3]

Despite the cost effectiveness of these programmes,[4] directly observed therapy was considered too costly and labour intensive to be widely used. It only became accepted as the standard of care in the United States in 1993, as part of a desperate response to the resurgence of tuberculosis linked to HIV and the emergence of multiple drug resistance linked to several institutional outbreaks. By then, years of neglect, a fragmented health care system, and collapse of the public health infrastructure made an emergency response necessary. This was particularly true in New York City where rates of tuberculosis had tripled, less than half of patients who began treatment were cured, up to 89% of patients in Harlem were lost to follow up and 27% were readmitted, drug resistance had increased from 10% to 23%, and institutional outbreaks of multidrug resistance with death rates greater than 80% had become commonplace.[5,6]

Spending money on directly observed therapy became easy to justify when the $200 000 cost of treating one patient with multidrug resistance could provide directly observed therapy for 700 patients, and where one outbreak worker would have to prevent only two hospital admissions for tuberculosis (average cost $15 200) to cover his or her salary.[3] Since then, widespread implementation of directly observed therapy and other control measures have resulted in a 21% decline in cases of tuberculosis in New York City in two years, with further reductions expected.[6,7] By the end of 1995, New York had seen over 2500 patients complete directly observed therapy, and another 1500 patients are currently enrolled. The greatest danger now is that the programme has been so successful that its support could erode, as resources are diverted to other priorities such as short term cost containment.

Worldwide, tuberculosis is the largest cause of death from a single infectious agent and contributes 25% of avoidable adult deaths in developing countries.[8,9] The potential role of directly observed therapy in developing countries (which contribute nearly 97% of the world's estimated 8 million cases of tuberculosis cases and 3 million deaths from the disease, and where labour costs are low) would seem straightforward.[8,9] The need for such an approach is obvious. Rates of completion of treatment of 25-50% with unsupervised treatment have improved to cure rates of 80-90% and relapse rates of less than 5% with supervised short term directly observed therapy.[8,10,11]

Other studies have shown that chemotherapy for smear positive tuberculosis is one of the most cost effective health interventions in the world.[8,9,12] Despite its merits, however, directly observed therapy remains underused. This is because of the sheer size of the tuberculosis problem, the absence of adequate funding and trained personnel in poorer areas, and the lack of political will to implement such programmes. Unfortunately, given the industrialised countries' current focus on their own economies and reductions in foreign aid, spending on cost effective programmes of directly observed therapy is, like changing the oil filter, being avoided until more costly remedies are needed.

Britain and other European countries have also seen recent increases in rates of tuberculosis,[13,14] and the question of starting supervised chemotherapy has been raised.[15,16] Britain is not the United States, however, and the sound reasons for implementing directly observed therapy in a country with 35 million uninsured people may be less compelling in a country that has a national health system and chest clinics to closely monitor patients.

None the less, recent British reports of increasing rates of tuberculosis among the homeless and in larger cities, and of nosocomial outbreaks of tuberculosis and multidrug resistant tuberculosis in patients with HIV, make it clear that Britain is not immune to conditions that can foster transmission of tuberculosis.[14 17-19] This situation could be exacerbated if evolving changes in the NHS affect local tuberculosis control programmes[19] and result in less follow up and lower completion rates for treatment. The United States Centers for Disease Control recommends that all patients be considered for directly observed therapy, but that if more than 90% of patients in an area are completing treatment the approach could be applied only to unreliable patients.[1] Britain may be spared the need for directly observed therapy if rates of non-completion are still as low as the 4% reported among children in England and Wales in 1983[16] but not if rates are as high as the more than 10% reported in adults in 1988 and in homeless people (45%) in 1992-3.[20 21]

The United States has learnt the benefits of directly observed therapy the delayed and expensive way. Other industrialised countries could undoubtedly save money by adopting directly observed therapy, especially in populations where tuberculosis is increasing and adherence to treatment is suspect. However, it is imperative that each country uses its own good epidemiological and clinical data to decide.

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The future shape of accident and emergency services

Cannot be considered in isolation

Emergency services are under strain across the board in Britain, as demand for out of hours visits from general practitioners, new attendances to accident and emergency departments, and emergency admissions increase. The crucial importance of scarce specialist resources as back up to accident and emergency departments was illustrated in the recent case of Nicolas Geldard, who died in December after ambulance crews visited four hospitals before finding one that could provide computed tomography and a neurosurgical bed.[1] The latest report from the Audit Commission into initial hospital emergency care[2] substantiates reports of pressure on accident and emergency departments. Increasing attendances and staff shortages mean that patients still wait for long periods before they are seen by a doctor, delays that are often related to meeting Patient's Charter standards. Junior doctors are in short supply, 60% of departments have only one casualty consultant, and only three of the 11 sites visited by the commission had on site, around the clock, experienced medical cover.

Once a patient requires admission, the commission found that long trolley waits for beds and "logjams" in accident and emergency departments often depended on factors outside the control of department staff. Specialists and facilities needed to treat children, frail elderly, and psychologically disturbed patients were unevenly distributed. Coordinated teams trained in advanced trauma life support and supported by on site computed tomography scanners, anaesthetics, and intensive care facilities were not universally available.

The commission's solution is fewer, larger accident and emergency departments each treating at least 50 000 patients a year to "maintain even the present quality of care." Only a third of accident and emergency departments in England and Wales are this size. If "good access" is defined as being within 10 miles of an accident and emergency department, and if half of the smaller departments were amalgamated, 31 departments would close, perhaps to be replaced by minor injury units.

How much weight should be put on the commission's recommendation? There are four reasons why it should be regarded with caution; the nature of the evidence offered, the effectiveness of alternative services, the implications for access, and the potential impact on other forms of hospital provision.

What is the appropriate size for an accident and emergency department? In the management of major trauma, evidence of "optimum" size is unclear,[3] although reviews indicate the benefit of larger departments and trauma systems.[4] The commission acknowledges that some small departments provide well coordinated trauma care. However, given the rising demand and the scarcity of accident and emergency and specialist staff, the commission's report (in common with other reviews[5 6]) recommends larger departments on the grounds that these would provide improved quality of care. This would include 24 hour cover, better training for junior