psychosocial consequences. They need to attend clinics and have regular blood tests. Furthermore, minor toxicity can affect the quality of life, particularly if the drug is to be taken for many years by those who would otherwise be well.

Zidovudine is still the only antiviral drug available with proved efficacy in HIV disease, but the extension of its licence to asymptomatic disease does not make the decision of when to start treatment any easier for the doctor or the patient. A decision based solely on the results of a laboratory investigation that is not universally available and whose biological and laboratory variability is considerable is clearly difficult.[5] The terms "repeated" and "rapidly falling" in relation to CD4+ cell counts are not defined clearly because the data are insufficient. The European and Australian trials in asymptomatic people must continue to answer fully the long term questions about efficacy and toxicity. Any move to intervene in asymptomatic infection and to prescribe low doses should be approached with caution.

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Endemic bladder stones

Now disappeared from developed countries but still commonplace in much of Asia

From antiquity to the early twentieth century Europeans were prone to bladder stones. Along with circumcision and trephining their removal is one of the three oldest surgical procedures.[1] Bladder stones remained common in the nineteenth century within certain "stone districts," such as Norfolk, where itinerant lithotomists flourished, and in London "cutting for the stone" was the commonest operation at the Westminster Hospital.[2] Suddenly they disappeared, so that by 1957 Myers could write that only one child with a primary bladder stone had been seen at the Hospital for Sick Children, Great Ormond Street, in the preceding 20 years.[3]

The cause of this once common condition was probably dietary. Although the poor, particularly the urban poor, were most susceptible, malnutrition did not seem to be the cause. Several theories have implicated the cereal composition of the diet.[4,5] In an ingenious study Halstead noted a negative correlation between the number of cows per head of population and hospital admissions for bladder stones throughout nineteenth century England and suggested that in areas where milk was short infants would be fed "pap"—bread and water.[6] This diet of a single cereal (wheat) was implicated as the cause of bladder stone formation. The subsequent decline in bladder stones coincided with the advent of the milk train and pasteurisation, both of which brought milk to the urban poor, reducing their dependence on pap. The recent hypothesis that a low calcium intake also encourages bladder stone formation may further explain why the increased availability of milk hastened their disappearance.[7]

Although they have disappeared in developed countries, bladder stones remain an important cause of morbidity in a belt extending from the Middle East across India and Thailand to Indonesia. In this endemic area cystolithotomy accounts for about 10% of surgical operations in children[7,8] and in some pockets of high endemicity in Thailand up to half of all non-obstetric surgery.[9] Within this belt the urban middle classes are invariably spared. Just as in nineteenth century England, a diet based on a single cereal seems to be the most important aetiological factor, whether this is wheat ("bulgur" in Turkey), rice, or millet.[5] Maize, however, the staple food in much of Africa,[10] does not seem to be implicated, and South Americans also seem to be curiously exempt, possibly because of a more mixed cereal component to their diet (S Ismail, personal communication).[11]

Endemic stones from both the bladder stone belt and English collections 80-200 years old consist of ammonium acid urate and calcium oxalate.[12] These contrast with those composed of phosphates and calcium oxalate, which are still seen in developed countries and result from urinary obstruction or infection. Ammonium acid urate is probably the more important substance in the nucleation of endemic stones,[12] its precipitation requiring high urinary concentrations of both uric acid (which is present in all normal children, falling to adult concentrations by the age of 10) and ammonia. The diet may favour precipitation of ammonium acid urate in several ways. Firstly, a single cereal diet of rice in infants raises the urinary ammonia concentration.[13] Secondly, a diet low in calcium, such as one of rice, little or no milk, and soft water, would result in hypocalciuria, which facilitates precipitation of ammonium acid urate in vitro.[14] Thirdly, urinary pyrophosphates act as non-specific inhibitors of precipitation,[15] and their presence is promoted by dietary phosphate, again found in milk. Although certain foods raise the urinary uric acid concentration, it is not clear if they play an important role in formation of ammonium acid urate stones. Dietary factors that influence the precipitation of the other major component of endemic stones, calcium oxalate, are less well defined.

Does the single cereal theory alone explain the variations in the prevalence of bladder stones within the Asian bladder stone belt and their absence in South America and Africa? Final proof of the single cereal theory is lacking. This will depend on evidence that the essential prerequisite, a raised urinary ammonia concentration in infants, can be caused by each of the implicated cereals when eaten singly and is not caused by maize (thus explaining the absence of stones in Africa) or by a mixed cereal diet. So far, no studies have compared urinary ammonia concentrations in areas of high and low prevalence. On theoretical grounds milk may have a protective role against the development of bladder stones,[7,14,15] but no studies have examined whether communities in which weaning is late experience fewer stones. Conversely, early weaning, often on the first day after birth, is the custom within one small pocket in Thailand where bladder stones are hyperendemic,[16] but it is not known whether other communities in which neonates are weaned are more susceptible. Nevertheless, given the large variation in Asian weaning practices, the age of weaning is unlikely to explain the unique existence of a stone belt. Hard water, which can contribute a

large proportion of the daily calcium requirements, may well reduce the prevalence of bladder stones,[7] but again, the effect of differing water hardness on the distribution of stones is completely unknown.

Development may result in endemic stones disappearing, but there is no evidence that the poor of the bladder stone belt in Asia have reached the stage of the declining disease experienced by the poor in England at the turn of the century.

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The new agenda for general practice computing

Time to exploit the potential for improving patient care

In the past few years general practice computers have moved from innovation to implementation. The proportion of practices with computers has risen from a quarter in 1989[1] to half this year,[2] and within another two years 90% of practices will probably have them. This process has been accelerated by the new contract for general practice, with its requirements for screening and its reimbursement of some computer costs,[3] and by the imminent arrival of indicative drug budgets, fund holding, and medical audit.[4] Modern practice management demands computers.

This should not, however, be the end of the story. Most general practice computer systems still emphasise data entry and repetitive tasks rather than exploiting the full potential of the technology. Though they are adequate for entering and storing administrative data on patients and performing routine jobs, such as repeat prescribing and prevention recalls,[2] they need to be developed to handle three key aspects: the computer clinical record, communications, and the quality of patient care.

Clinical recording is possible—just—with the more complex general practice computer systems, but there are many outstanding issues. The Read clinical classification is the only coding system to offer full cover for the symptoms, procedures, and events of primary care.[5] Other classifications used in general practice computers may suffice for epidemiology and problem listing, but they fail as tools for recording everyday clinical care. The government's recent purchase of the rights to the Read clinical classification is therefore welcome because it removes the main obstacle to its general use.

Using the most appropriate classification system is not in itself enough. Techniques for entering clinical data need to be refined so that it takes no longer and is no more difficult than writing the paper record. Furthermore, the format of data entry and presentation needs to be flexible enough to allow the user to emphasise personal interests and incorporate new knowledge. If, for example, a new risk factor for coronary artery disease is identified, such as birth history,[6] the doctor needs to be able to record it as such without recourse to user groups and programmers. It is not sufficient just to be able to record it; it should be recordable as a coronary risk factor and presented alongside the other coronary risks.

Every clinical entry will require an author and a date of entry, and overwritten data need to be retained in a background file. Such an "audit trail" is necessary for medicolegal purposes, especially if the computer record replaces the written one; for a doctor to interpret accurately clinical information; and for protecting the integrity of the medical record. It will increase in importance as record linkage allows the possibility of hospital doctors, nurse practitioners, and community nurses, as well as vocational trainees, contributing to the general practice database. With safeguards such as these, an accurate and well presented computer clinical record should improve the care of patients.

The second potential to be fully exploited is communication among computers. There are exciting prospects for links among general practice, hospitals, family health service authorities, pharmacists, and community services using fixed lines, modems, or smart cards.[7] Such communications should ensure that all those concerned in a patient's care are kept fully informed and help in managing the internal market.[4] In time patients may benefit more directly from computer access to general medical information and, as with banking, to simple services such as making appointments and ordering repeat prescriptions.

The last item on the immediate agenda is probably the most important: computer systems must begin to confront primary care's greatest challenge, the quality of patient care.[7] At its most basic a computer based clinical support system can offer the doctor information and advice about a contemplated diagnosis, drug, or procedure. Such passive information may be augmented by advice relevant to the particular clinical case from a decision support system—either help with diagnosis or tailored advice on management plans.[9]

The most important development, however, is likely to be computer based protocols for clinical care. Each practice or practitioner will define the care they will offer to groups of patients. Such a protocol for patients with hypertension, for example, would include the diagnostic criteria, the targets for control, the frequency and content of review, and the therapeutic regimens to be used. Protocols can be designed for the common chronic and acute illnesses, prevention, and administrative aspects of care.[10]

Computer protocols will offer substantial benefits over conventional ones. Protocols can be compared with those of other practices and with a professional consensus, making differences between levels of proposed care explicit. This will lead to a greater degree of standardisation of care, and, as changes towards the middle ground will be voluntary, will do so without interfering with clinical freedom.

When a patient for whom a protocol is appropriate consults the doctor the computer will offer the chance to enter data using that protocol. As well as prompting the doctor to live up