

Adoption of telemedicine -- from pilot stage to routine delivery

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Adoption of technology tends to follow an S-shaped growth curve. This also applies to the adoption of new technologies in medicine. In the US, studies have shown that adoption starts earlier in larger hospitals and that the rate of growth is faster in the larger hospitals. The rapid growth of new imaging technologies, CT and MRI, shows clearly that technology will be adopted if the users want it, i.e. if doctors perceive that it improves the way they can practice. Cost and bureaucratic obstacles (regulation) seem to have relatively little influence on the rate of adoption in these circumstances.

Telemedicine can be regarded as a technology, but its adoption has had a very patchy history. Digital telemedicine became practicable at the end of the 1980s with the availability of low-cost computing and digital telecommunication (e.g. ISDN). Since then, a wide range of pilot telemedicine applications have been trialled, but only teleradiology has achieved adoption into routine service.

Why has so little adoption of telemedicine taken place? It is conventional to say that widespread adoption of telemedicine is not likely to occur without properly documented evidence of cost-effectiveness. However, the experience of teleradiology contradicts this, since even now there are no studies showing cost-effectiveness on any scale, e.g. enterprise-wide use of teleradiology. On the other hand, the case of telephone triage may be significant. Telephone triage was brought into widespread usage in a number of countries as a political initiative, by governments which wanted to reduce demand on emergency departments and on primary care. However, there is little evidence of demand reduction in practice and the recent policy U-turn in London suggests that perhaps having evidence for cost-effectiveness may actually be important in the process of telemedicine adoption.

Where does this leave the rest of telemedicine, which is largely stalled at the Early-Adopter stage? In introducing any new telemedicine application, there are a number of stages which must be passed, such as testing whether it is safe, ethical, accurate etc. The analogy with the introduction of new drugs may be helpful: phase 1 for safety, phase 2 for efficacy, phase 3 for effectiveness and phase 4 for post-marketing surveillance. Most telemedicine applications do not progress beyond the small trial stage. For example, systematic reviews can be used to identify telemedicine applications which hold promise. Of these, only teleradiology has been widely adopted. The other applications, telepsychiatry, transmission of echo studies and teledermatology, all remain stalled in the early phases. Tele-stroke looks like an interesting candidate for widespread use in the future.

The Northern Peripheries Project has chosen certain niche applications for testing in different national settings. This will provide valuable comparative data between countries. However, on its own this will not be enough to stimulate growth beyond the Early-Adopter stage. The next step should probably be to concentrate on identifying the advantages to the users in improving their practice.