Point-of-care testing leads the way

The last decade in healthcare has witnessed an agenda that has become increasingly focussed on improving quality and productivity, with better access to a more patient centred approach to care. This is against a backcloth of a level of spending on healthcare that many consider to be unsustainable. At the same time there have been unprecedented developments in technologies to support the diagnosis, treatment and ongoing management of disease. These trends are certainly applicable in medical diagnostic testing, where the discovery of new biomarkers and new technologies have led to an inexorable rise in the number of tests being performed. Today we are seeing an explosion in methods for detecting genetic markers, particularly in the field of infectious agents.

The increasing volume of testing has been accommodated with the aid of automation, such that several thousands of specimens can be handled every day. However this comes at a cost to the process of care as specimens have to be sent to a laboratory, which may be some distance from the point where the patient is being seen by the clinician. The consultation between the clinician (or another health professional) and the patient lies at the core of healthcare, which is disrupted when there is a need to send a specimen for analysis. It is for this reason that technologies for point-of-care testing began to evolve.

Point-of-care testing (POCT) is testing performed at the point (in time and place) where the clinician needs to make a decision guided by a specific test result. This may be where a decision relates to making a diagnosis, selecting or optimising a treatment and monitoring the efficacy of that treatment.

POCT technologies have evolved with the development of micro-fabrication, miniaturisation and communication technologies. The devices produced today can be portable, highly operator friendly and connected to electronic patient records. POCT is employed in many settings including the home, workplace, pharmacy, primary care centre, as well throughout the hospital. It is no longer used solely in the life threatening, emergency situation, but can be employed at any stage throughout the care pathway.

POCT can therefore be seen as improving the core of healthcare, the patient-clinician interaction, enabling rapid, better informed decision-making. This can bring a range of benefits, including an improved experience for both patient and clinician, greater patient involvement in his/her care, faster decision making with reduced lengths of stay, fewer clinic appointments and less requirement for referral to hospital, resulting in clinical, operational and economic benefits. A good example would be the diagnosis of sexually transmitted infections (STIs).

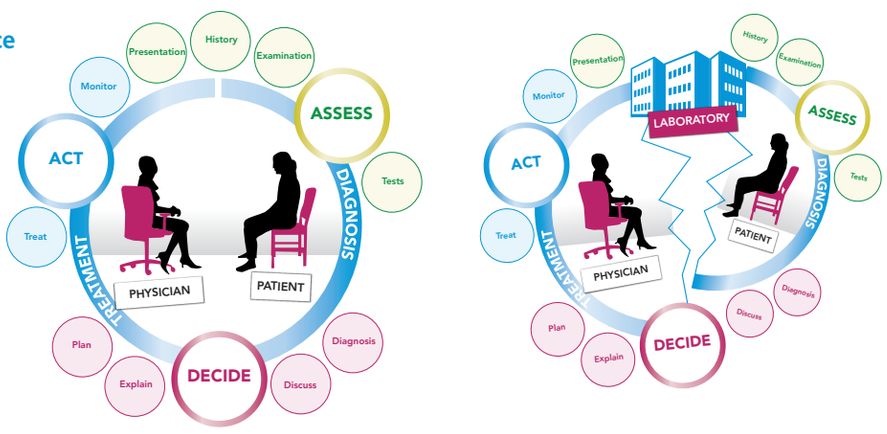
Sexual health is an important component of general good health. Sexual health problems such as STIs are relevant to all sexually active people, but occur more often in those at higher risk, such as young people and men who have sex with men (MSM). Public Health England surveillance data show STI diagnoses remain high indicating that we may need to do more to tackle the problem.

A key feature of many STIs is that a large proportion of people who have infections have no symptoms, therefore do not know they are infected and do not seek treatment, continuing in risky behaviours such as unprotected sexual intercourse, putting their partner(s) at risk of infection.

Three infections, chlamydia, gonorrhoea and HIV, have a significant impact on people's quality of life and managing them represents a large cost to the NHS. Chlamydia is the most common bacterial STI in the UK, with rates highest in 16 to 24 year old men and women. Gonorrhoea is much less common, and tends to be seen in high-risk groups that have more frequent partner change, such as MSM, younger age groups and in certain ethnic populations. Both infections can lead to pelvic inflammatory disease, an acute complication in women. This may cause further problems with fertility and ectopic pregnancy, with infertility representing a significant cost to the health services.

HIV is a chronic infection that has profound impacts on people's lives. It can be managed with antiviral medicines and infected individuals can now expect a life expectancy similar to healthy people. However, it costs an estimated £300,000 to treat someone diagnosed with HIV over his or her lifetime.

Is the Laboratory Service a disruptive influence on the patient-clinician interaction?



We are seeing an increase in the number of people being tested for STIs. Testing and early treatment not only cures non-HIV sexually transmitted infections in the individual, but also reduces the risk of complications, providing benefits of reduced transmission to the wider population. This is made possible by the high quality diagnostics we have for STIs. POCTs may play an important role in reducing the time from test to treatment. contributing to a new way of delivering care where patients are tested, get their results and positive individuals can be treated on the same day.

The microscope continues to play a central role in enabling the immediate diagnosis of STIs. This has not changed for over 50 years and can only be done in specialised centres by trained technicians. However much has changed since microscopy was first introduced.

The rapid accurate detection of STIs will become increasingly important and the role of microscopy is likely to diminish. It is likely that POCTs will eventually be able to provide a wealth of new information, greatly enhancing the accuracy of clinical diagnostics. This, combined with advances in information technology, will allow less medically skilled staff to manage patients.

The arrival of accurate POC STI diagnostics is a "game changer". The first generation of tests is currently able to provide a result for gonorrhoea and chlamydia in 90 minutes, with similar performance to standard laboratory based tests. In the future the turnaround time will shorten to around 30 minutes and has the potential to also provide accurate information on anti-microbial sensitivities. These real-time decision enabling technologies have a number of important implications for patients and health care providers. They will eliminate the uncertainties associated with the use of microscopy as we move towards infection-specific management strategies. Patients will get the correct treatment for their problem and return to health sooner, reducing the need for follow-up care. Health care professionals will also feel more confident in their management of patients. This will improve the quality of the consultation and can enable less highly specialised staff to appropriately manage patients.

Society is changing rapidly with more liberal attitudes to sexual relationships. Giving people access to test results within 30 minutes is likely to be very attractive and can increase the uptake of testing and screening. Until recently this was not possible with it usually taking over a week for health care professionals (and patients) to get an accurate result for a specific STI. For people with no symptoms, POCTs can be accessed outside of health care settings, for example in pharmacies, enabling easy access and immediate treatment. Thus POCTs will allow more people to access good quality STI care, and is putting the patient first.

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