Skills fade: a review of the evidence that clinical and professional skills fade during time out of practice, and of how skills fade may be measured or remediated.

1. Introduction

This is an exploratory study looking at skills fade in the health sector, particularly in doctors. It doesn't seek to make policy recommendations, rather to survey the evidence on the topic. The scope of this review is to identify what evidence there is to say when and how time out of practice affects skills, competence and performance. The review has looked at:

- how important the length of break from practice is
- how this impact differs by type of practice
- mitigating factors for any reduction of skills.

This review has gathered evidence from the published literature on doctors, other health professions and from other skilled professions.

2. Background

Time out from professional practice may happen for a variety of reasons:

- maternity, paternity or family leave;
- ill health;
- suspension;
- a career break or foray into another career;
- extended travel or
- study leave.

It makes sense that time out may affect skills and competence. Understanding the impact would enable the professional, their employer and their regulatory body to find a way to address any training or support needs.

This issue interests us because it's our duty to protect the public by making sure that doctors meet the expected standards of good medical practice. The various ways of regulating and monitoring performance through revalidation should provide assurance of the good medical practice of working doctors (Locke et al, 2013). But doctors returning from a break in practice are a potential area for concern. As the Academy of Medical Royal Colleges (AoMRC) (2012b, 2012c) points out, within the current licensing and revalidation framework, there can be a gap between a doctor's return to practice and their review at appraisal and revalidation.

Some breaks in practice are the result of the doctor being suspended as part of fitness to practice proceedings; either by an interim orders panel while an investigation is being carried out, or by a fitness to practise panel at the end of the hearing. Case (2011a, 2011b) discusses the unintended effects of interim suspensions on doctors, saying the impact can be more punitive and severe than the final sanction (p364). She talks of 'a costly de-skilling effect which needs to be 'addressed before the doctor returns to practice'.

The Department of Health (2000) in its consultation on modernising medical regulation also raised public protection concerns about restoring doctors to the register 'after a lengthy period of erasure or after a formal reassessment of skills.' In 2003, a National Audit Office report on the effects of suspensions of hospital and ambulance staff in the

NHS in England pointed out that one of the costs of suspension is the risk of loss of clinical skills, which in turn may impact on patient safety.

3. Research questions

We wanted to find out:

1) Is there any evidence to suggest that an individual de-skills over time out from practice and if so, over what period of time?
2) What factors affect skills fade and how – for example, age, specialty, supervision, level of autonomy etc.
3) Do other comparable regulators do anything to assess performance after a prolonged break in practice? If so, why did they introduce such assessments and what is the evidence base behind it?

4. Research strategy

This research used a systematic approach to identify and evaluate written evidence to answer the study research questions.

This incorporated a literature search and web-based review of online publications.

A systematic review of the medical literature has been undertaken using online databases.

The literature has been evaluated for quality and for relevance to the research questions.

The content of relevant papers has been summarised in order to answer the review research questions.

5. Research methods

This review was carried out in three phases:

- In the first phase, published evidence on the impact of time out on doctors was systematically searched for, reviewed and summarised.
- In the second phase, published evidence on the impact of time out on other regulated health professionals was systematically searched for, reviewed and summarised.
- In the third phase, published evidence on the impact of time out on work-related skills and competence was systematically searched for, reviewed and summarised.

  A call for evidence was also sent out via email to fellow medical regulators internationally. This gathered eight responses.

6. Overview of the quality and relevance of the included papers

Overall, the topic of skills fade after a break from practice on the part of doctors or other health professionals has not been studied widely. There is a body of research looking at retention of skills after a period out of practice, or after a gap since learning certain skills. There is also one looking at the opinions and experiences of medical and other healthcare professionals who are returning to work.

There have been other studies on skills fade, both of people working in healthcare and other professions. Some research papers of note were found on the subjects of doctors, dentists, nurses, occupational therapists, pharmacists and physiotherapists. No papers of relevance to this review were found on opticians or veterinarians.

There have been studies on skills fade in railway workers, machinery operators, pilots and army personnel. The most comprehensive analyses of skills fade have been undertaken by research teams looking at armed forces service personnel. The theoretical basis for the understanding of skills retention and skills fade comes from cognitive psychology and some studies have measured skill retention using experiments involving volunteers (usually university students).

The quality of the primary research studies mentioned is generally high. The studies follow good practice in terms of data collection, analysis and reporting, and taking into account the nature of the research conventions suitable to their research questions. However, many studies use small sample sizes and report considerable attrition between tests of retention. They also tended to be single site studies. For these reasons, any generalisations from findings should be cautiously made.

Military researchers carried out larger scale reviews of the evidence on skill retention They drew on a similar pool of evidence but incorporated primary and secondary research into reports on the literature.

In many studies it isn't clear how often practice and revision has been undertaken by subjects between tests. There are many studies looking at retention of learning in novices and only a limited body of research looking at how experts or those with years of practice retain their knowledge. Studies have also tended to look at single skills or single sets of skills rather than overall competence in a role.

The applicability of findings from studies outside medicine is limited, given the often specific nature of the skill being assessed. Within the medical and health literature, reports on skill retention have mainly looked at the impact of training interventions.

7. Answering the research questions

7.1 Is there any evidence to suggest that an individual's skills fade over time out from practice and if so, over what period of time?

There is substantial evidence that time out of practice does impact on the individual's skills. Skills have been shown to decline over periods ranging from six to 18 months, according to a curve, with a steeper decline at the outset and a more gradual decline as time passes. The amount of time between learning and losing a skill varies between skills and between individuals, with many mitigating factors. Studies have tended to look at skill retention at intervals up to two years. This has more to do with the time limited nature of research studies than two years necessarily being a vital cut off period.

This review has found no clear consensus about what length of break from practice ought to result in an assessment of competence. This depends on the skill being assessed, their original training and other issues such as how long they have practiced the skill and how often.

7.2 What factors tend to influence and mitigate for skills fade – for example, age, specialty, supervision, level of autonomy etc.

Evidence from several studies looking at retaining specific clinical, surgical and life support skills suggests that level of prior expertise and opportunity to practise similar skills in the interim can help the individual's ability to retain a particular skill. The concept of over-learning is key here, given that the evidence from military studies shows that the higher the level of learning and proficiency prior to the break from work, the higher the level of retained skill will be.

There is a consensus that skills fade may be mitigated through keeping in touch with peers during a break from work and staying aware of relevant developments.

There's evidence that self-assessment of competence doesn't necessarily match the findings of more objective assessments. This has potential patient safety implications, and suggests that self-assessment wouldn't be enough to determine how skills fade should be addressed.

Grace et al's (2011) study suggests that older age and length of time out can lead to lower performance scores when the returning individual's skills are assessed. The results of this study are clearly relevant to this review, just as they were to the AoMRC return to practice review.

The conclusions of reviews in both the military and in industrial and professional literature are that competence retention and deterioration depends on organisational, job or task training and assessment and individual factors. The degree of influence these factors have, and the nature of influence that specific aspects of, say, the individual's personality or experience have, has not been widely posited or tested outside of the military research field. As such, all these should be taken into account when assessing or addressing the fade.

7.3 Do other comparable regulators undertake any form of performance assessment following a prolonged break in practice? If so, what led to the introduction of this assessment and what is the evidence base behind it?

Health professional regulators have various responses to practitioners wanting to return to practice after time out. Within medicine, UK doctors must at present meet revalidation requirements in order to show their ongoing fitness to practise. They must also abide by the requirements of their Royal College about maintaining skills and knowledge. There are specific requirements for doctors in training about stepping off and back onto their training programmes.

Outside the UK, various approaches are used. In Finland, the Republic of Ireland and France there are no requirements placed on doctors to prove their fitness to continue to practise on returning after a break. Australia and New Zealand have statutory requirements about proving fitness to continue to practise, particularly if the break is longer than three years. In the US, different State Medical Boards have different requirements regarding returning to work. There are no reports of particular performance assessments that take place, although some US state boards and the Registrar of the Medical Council of New Zealand may require one to be undertaken.

The health professional regulators in the UK have requirements regarding CPD that must be met in order to return to the register. The NMC does validate return to practice courses but there is variation between such courses in terms of their length and content. The HCPC requires returners to undertake 30 days of updating if they are out for over two years and 60 days updating if they take over five years out.

10. Conclusion

This review has found limited and mixed evidence to support the notion that skills decline over a fixed period of time.

Health professionals may take time out from professional practice for various reasons. This time out may be accompanied by removal from the register for that profession. It may also be as a result of removal from or suspension from the register. There is little known about the impact that this time out may have on the registrant's competence, performance and skills.

Whilst the requirements for re-registration are set down in legislation, there's little evidence on how exactly those requirements were determined.

There's evidence that skills decline according to a curve, with the greatest decline being during the first few months, and subsequent decline being at a much slower rate. However, other studies contradict this.

Many studies of retaining specific skills measure retention at six, 12, 18 and 24 months. There is some consensus between health professional stakeholders that two or three years out of practice should signify a need for reassessment and retraining prior to a full return.

There is limited evidence to determine exactly how time out of the profession affects doctors and other health professionals' skills. This limitation is due to there being a limited number of studies on this topic rather than there being poor quality or inconclusive evidence. The largest body of evidence comes from tests of retention of specific skills learned through training, rather than from studies of health professionals before and after time out. Outside of medicine, skills fade has been a matter of concern for organisations requiring high reliability and a strong safety culture. Evidence from the military, in particular, shows that skills retention and fade are influenced by multiple factors, not just the individual.

Skills decay is a complex phenomenon. It is influenced by a range of factors. Health professional practice involves the performance of a range of skills in a range of contexts. These skills may decline at different rates for different people in different settings. The model of skill retention posited by military researchers weights individual, organisational, task, training and interval factors. Attempts to determine how these factors impact have shown they do influence the degree to which skills are retained, but how they interact has not conclusively been shown.

Future research to determine how best to assess and mitigate skills fade when a practitioner returns to work should take account of individual circumstances and the range of influencing factors. Further research in this area is needed, especially looking at retention of global as well as specific skills and looking at retention of skills in experts as well as novices.