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**Using the Plan-Do-Study-Act (PDSA) cycle to make change
in general practice**

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Using the Plan-Do-Study-Act (PDSA) cycle to make change in general practice

As new members of the team, GP trainees can provide a fresh perspective on practice systems. They are therefore ideally placed to enact change within practices. However, GP trainees may feel ill-equipped to suggest and deliver change to their practices. This article will explore the concept of change management using the Plan-Do-Study-Act (PDSA) cycle and consider how to initiate change by providing a structure to guide the process.

The GP curriculum and change management

Contextual statement 2.02: Patient safety and quality of care states that as a GP you should:

- Understand principles of improvement methodology to facilitate change
- Show that, as a specialty trainee (GP) within the team environment of general practice, your experiences gained in previous settings can be shared with colleagues. Recognise that the formal Patient Safety Agenda is relatively recent and may be unfamiliar to well-established colleagues
- Illustrate how changes in behaviour and/or systems can influence patient safety

Contextual statement 2.03: The GP in the wider professional environment states that GPs should be able to:

- Take into account the needs, feelings, values and expertise of others
- Understand the process of change and factors that influence it, and use resources for obtaining support in developing and leading change
- Apply quality improvement methodologies
- Demonstrate the ability to improve the quality of healthcare delivered to your patients by the practice
- Engage positively with change
- Successfully manage a simple quality improvement project

The change process

Use of a structured approach to make a change can ensure better delivery of healthcare, develop team work and leadership skills (RCGP, 2016a). Use of this structured approach can address specific quality problems and positively influence organisational culture (Reed & Card, 2016). Quality improvement activities form a mandatory component of the curriculum for GP trainees. GPs are also then expected to continue undertaking quality improvement activities as part of appraisal and revalidation (RCGP, 2016b).

Failure to manage change effectively can leave members of the practice feeling excluded, confused and powerless (Strebel, 1996). As illustrated in Box 1, barriers to change can be divided into individual, organisational and external factors (National Institute for Health and Clinical Excellence (NICE), 2007).

(Insert Box 1 here)

PDSA cycle

Although there are multiple models offering frameworks for change, this article focuses on the PDSA cycle. The PDSA cycle, also known as the Deming cycle, was adapted from the works of Shewart in the 1920s. The four-stage cycle focuses on the continual improvement of a product or process. In the 'plan' stage, a change aimed at improvement is identified. The 'do' stage sees this change tested and the 'study' stage examines the success of the change. The 'act' stage identifies adaptations and next steps to inform a new cycle (Taylor *et al*, 2013). The PDSA cycle is widely used within the healthcare setting (Taylor *et al*, 2013) and is recommended by the RCGP Quality Improvement in General Practice Guide (RCGP

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3 Quality Improvement in General Practice, 2000). Figure 1 illustrates each stage of a PDSA
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5 cycle.
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10 *(Insert Figure 1 here)*
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14 The PDSA cycle can be considered an efficient way to collect data as it advocates collection
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16 of just enough data to inform future PDSA cycles. The iterative nature of the PDSA cycle
17
18 helps to minimise resistance when change is implemented. This is achieved by small
19
20 intervention cycles that help increase confidence in the change by incremental modifications
21
22 and refinements (Leis & Shojania, 2016). Whilst the PDSA cycle is simple in concept, it can
23
24 be challenging to authentically execute (Reed & Card, 2016).
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29 In the next section, the PDSA cycle will be explained with an example. The example
30
31 illustrates how a GP trainee may initiate change within a GP surgery by designing an
32
33 anticoagulation template for the GP computer clinical system. The aims of the change allow
34
35 for a standardised approach to anticoagulation initiation and drug monitoring standards.
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42 **Plan stage**

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45 The first step before making a change is to stop and describe what is currently going on
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47 (RCGP Quality Improvement Guide, 2000). This helps justify the reasons for making a
48
49 change. There are a variety of tools that can help identify potential areas of change. A
50
51 strengths, weaknesses, opportunities and threats (SWOT) analysis is a strategic planning tool
52
53 that can be used to consider internal and external factors which currently affect the
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55 organisation (Iles & Sutherland, 2001). GP trainees may therefore find this a useful way of
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3 identifying an area within the GP surgery that may benefit from a quality improvement
4 activity. Haberburg (2000) identifies that there is uncertainty over the origins of the SWOT
5 analysis, although it was thought to have been used by academics at the Harvard Business
6 School during the 1960s. Box 2 details each domain of a SWOT analysis. A sample SWOT
7 analysis, seen in Table 1, can be completed individually or shared amongst the practice team
8 to gather an overview of the current position of the practice.
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16 *(Insert Box 2 here)*

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18 *(Insert Table 1 here)*
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20 Results from the SWOT analysis can uncover an area to develop for a PDSA cycle. In this
21 example the practice does not have a standardised template for commencing patients on a
22 direct oral anticoagulant (DOAC). There may be inadequate record keeping on patients being
23 adequately counselled when initiated on a DOAC. Without adequate record keeping there is
24 no evidence that adequate information has been given to patients (for example on carrying an
25 anticoagulation alert card or advice on drug monitoring).
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36 Other examples include: restructuring the repeat prescription signing process at the practice
37 (to provide protected time for script signing), creating a doctor led triage system for home
38 visit requests (to assess suitability and reduce unnecessary home visits) and designing an
39 intervention to recall asthma patients requesting frequent reliever therapy (to optimise asthma
40 management).
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49 Once the area requiring change has been identified it is important to define what changes are
50 proposed. The pro forma in Table 2 can be used as a means of structuring a PDSA cycle.
51 The pro forma has been completed using the example of implementation of an
52 anticoagulation template.
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7 It is important to define the intended outcomes of the PSDA cycle and this can be done by
8 making the outcomes SMART: specific, measurable, achievable, realistic and time-based
9 (Doran, 1981). Leis and Shojania (2016) advocate small goals that can be tested and then
10 modified as needed. Therefore, for the initial PSDA cycle the focus is on one DOAC with
11 plans to include other anticoagulants on the template in future cycles.
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18 It is important that anyone involved or affected by the change has an opportunity for input to
19 the change process. Organisations or people that are affected by the changes in PSDA cycles
20 are known as stakeholders (Iles & Sutherland, 2001). Presenting a completed pro forma at a
21 practice meeting or in a tutorial with a clinical supervisor can help identify stakeholders.
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30 A stakeholder analysis is a tool to assess the influence and resources that the stakeholders
31 bring and it has the value of increasing the chance of success with the project by influencing
32 the planning and execution of the project (Varvasovszky & Brugha, 2000). It is important to
33 identify the stakeholders in the change process such that barriers and challenges can be
34 overcome at an early stage. Possible stakeholders may include GPs, practice nurses, GP
35 trainees, medical students, allied healthcare professionals, administration, the patients and the
36 practice manager. As part of the analysis it may be necessary to organise meetings or
37 telephone calls with the stakeholders to understand their perceptions and perspective. For
38 example, meeting the community pharmacist may lead to learning on drug interactions with
39 the DOAC which will help inform the anticoagulation template. Early involvement of
40 stakeholders is encouraged to help ensure successful change (RCGP 2015). This can provide
41 clarity on the changes intended from an early stage and encourage stakeholder 'buy in'.
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3 Proposed changes may be at risk of not being implemented if there is a lack of consensus on
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5 the necessity for change amongst the stakeholders (Dixon-Woods, McNicol & Martin, 2012).
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10 In the example in Table 2, it may be identified from discussions with the practice team that
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12 another GP surgery within the Clinical Commissioning Group (CCG) has already
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14 implemented use of an anticoagulation template. It may therefore be possible to share ideas
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16 with the respective practice team to see if a similar template can be adopted. Further to the
17
18 stakeholder analysis the pro forma should be updated to reflect any modifications made.
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20 21 22 23 24 **Do stage**

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27 In the 'do' stage, the changes identified are implemented (Gillam & Siriwardena, 2013).
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29 Changes from quality initiatives can have wide ranging consequences and include unintended
30
31 or unplanned consequences. These should be considered when measuring the effectiveness of
32
33 the change (Illes & Sutherland, 2001). In the example, a template could be designed with the
34
35 support of a GP from the team with experience of creating computer templates for the clinical
36
37 system. The initial template might provide a stepwise approach to standardise how GPs
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39 initiate a specific DOAC and set up a recall for drug monitoring. The GPs could then be
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41 informed about the new template and its use monitored over three months. A planned effect
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43 might be greater compliance with drug monitoring and an unplanned effect might be
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45 improved time efficiency within the consultation when using the template to assist record
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47 keeping.
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53 It is rare that efforts to drive improvement go smoothly (Leis & Shojania, 2016). For
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55 example, the template might be difficult to locate leading to poor uptake by GPs at the
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3 practice. Reed and Card (2016) identify that key learning can occur when changes do not go
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5 as planned. In this example difficulty locating the template might encourage a redesign of
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7 access to the template so that the template appears automatically when typing a designated
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9 read code.
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11 12 13 14 15 **Study stage** 16

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18 The 'study' stage identifies if the change implemented has made an improvement and
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20 whether further change is required. A suitable means of assessing whether there has been an
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22 improvement in quality of care should be utilised. For example, an audit could be performed
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24 to identify whether adherence to anticoagulation blood test monitoring guidelines has
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26 improved with introduction of the anticoagulation template. This might have patient safety
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28 implications, for example by ensuring that patients are on the dose of DOAC appropriate to
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30 their renal function.
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36 The Institute for Healthcare Improvement (IHI) (2017) states that "while all changes do not
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38 lead to improvement, all improvement requires change." A reflection can be useful to
39
40 consider whether the changes introduced amount to an improvement (Gillam & Siriwardena,
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42 2013). A reflective log entry in the Trainee ePortfolio may assist with development of critical
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44 thinking, analysis of learning and the identification of areas for further development (RCGP
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46 2017).
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51 The RCGP Quality Improvement Guide (2000) encourages the results of the change to be
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53 communicated with the stakeholders regardless of whether an improvement has been
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55 achieved. This ongoing communication will keep the stakeholders up to date throughout the
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3 PDSA cycle and aligned with any plans for future cycles. For example, the anticoagulation
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5 template could be cascaded to other practices at a local learning group to demonstrate the
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7 learning from the process and any improvements achieved. However, it is important to note
8
9 that change initiatives may not translate across organisations, for example because of
10
11 different organisational cultures and engagement with the iterative process of PDSA cycles
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13 (Walshe & Freeman, 2002).
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16 17 18 19 **Act stage**

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22 Leis and Shojania (2016) identify that improvements may not occur with the first PDSA
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24 cycle. Therefore, the 'act' stage focuses on what should be planned for the next PDSA
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26 cycle. This should incorporate any modifications that are deemed necessary from the 'study' stage
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28 that may lead to an improvement (Gillam & Siriwardena, 2013).
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34 The PDSA cycle demonstrated in Figure 1, should not be thought of as a process involving
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36 just a single rotation of the cycle. Further rotations are required for continuous improvement
37
38 (Taylor *et al*, 2013). Dixon-Woods & Martin (2016) identify that organisations often fail to
39
40 stick to changes from quality improvement projects after initial implementation and that
41
42 replication can help assure success. In the example, the anticoagulation template might need
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44 improvement with incorporation of other anticoagulants. Further engagement by the practice
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46 team with the PDSA cycle could ensure ongoing improvements to the template and shared
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48 ownership of successful change by the practice team.
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Conclusions

Engaging with a structured approach to change, such as the PDSA cycle can assist GP trainees with delivering change. Although not every change is an improvement, significant learning can occur through engaging with a quality improvement activity. An important aspect of delivering change is to ensure involvement of stakeholders throughout the change process. This increases their confidence in the process and will increase the likelihood of success. The PDSA cycle should not be considered as singular event but as a continuous process that aims to achieve incremental improvement. Undertaking quality improvement activities using a PDSA cycle will benefit GP trainees in their future careers and develop skills and experience in team working, leadership and change management.

Key points

- Practice teams can benefit from the insight that GP trainees bring from experience in other general practice and secondary care placements
- The analysis of strengths, weaknesses, opportunities and threats can provide a useful tool to identify possible areas for change
- Use of a pro forma may help GP trainees to structure a change management proposal
- Resistance to change from members of the primary care team and can be reduced by involving them in the change process
- Skills in change management can be developed by GP trainees and will be valuable throughout their careers

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Box 1. Barriers to change.

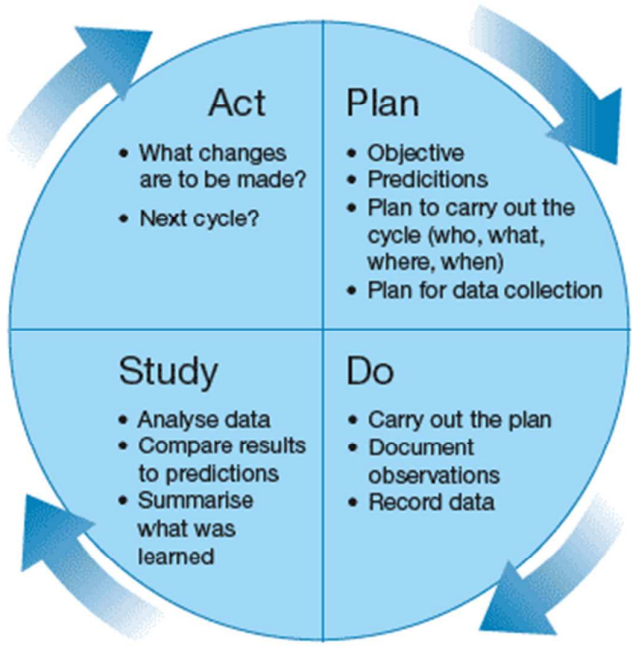
- Individual factors- There may be a knowledge deficit on how to enact change or a lack of motivation or time to engage with change (NICE, 2007). Individuals may carry out change without reference to a structured process thus threatening successful implementation of change (Reed & Card, 2016). Individuals may fail to consider the requirements for sustainable improvement (Auerbach, Landefeld & Shojania, 2007).
- Organisational factors- Lack of resources or personnel to deliver change (NICE, 2007). Practice culture resistant to change or engaging with the process of change (Reed & Card, 2016). Perceived cost implications of engaging with change such as loss of time for clinical commitments (Auerbach, Landefeld & Shojania, 2007).
- External factors- Conflicting priorities set by commissioning bodies and financial disincentives for the desired change at practice level (De Silva, 2015).

Box 2. SWOT analysis domains

- Strengths- advantages, positive factors, successful activities, attributes and areas where the practice team excels
- Weaknesses- disadvantages, negative factors, failures and areas where improvement is needed and preferably possible
- Opportunities- areas that present the prospect of improvement and potential benefit to the practice team by the implementation of change
- Threats- potential problems, areas that may have negative consequences in the future, activities or areas that may need to be appropriately managed/ require change

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Figure 1. PDSA cycle



Source: Scottish Government, 2008

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Table 1. SWOT analysis

Strengths (What works well at the practice?)	Weaknesses (What does not work well at the practice?)	Opportunities (Are there any upcoming opportunities for the practice?)	Threats (Are there any upcoming threats for the practice?)
<ul style="list-style-type: none"> • Onsite dispensary affording patients an easy way of redeeming prescriptions • Excellent team morale fostered by a daily coffee break • GP with experience designing templates for the computer clinical system 	<ul style="list-style-type: none"> • High number of inappropriate home visit requests • Frequent interruptions when signing repeat prescriptions • No standardised approach to anticoagulation initiation or monitoring 	<ul style="list-style-type: none"> • New building premises • New funding for a service needed by the community • New teledermatology equipment 	<ul style="list-style-type: none"> • Withdrawal of funding for a community service • Suspected closure of a nearby practice • Pending retirement of the practice's asthma nurse

Table 2. Example pro forma to assist with change management

Title: Developing an anticoagulation template for the GP medical record	
Name:	Date:
Stakeholders: GPs, practice nurses, administration, pharmacist, clinical commissioning group (CCG), anticoagulation clinic, patient participation group (PPG).	
Area of change: Implement an anticoagulation template accessible from the GP medical record to help ensure all patients with a CHA ₂ DS ₂ VASc score of one or greater have been adequately informed about anticoagulation, to help ensure the correct monitoring is being performed and that appropriate safety nets have been put in place for those on anticoagulation such as an anticoagulation alert card.	
Why needed: No current standardised approach to practice initiated anticoagulation and varying levels of baseline tests for DOACs.	
Proposed method of achieving change:	
<ul style="list-style-type: none"> • Liaise with CCG/ anticoagulation clinic to ascertain if a template is currently available • Meeting with PPG to assess suitability • Meeting with community pharmacist to identify anticoagulation medication interactions that should be flagged on template • Meeting with clinical system administrator on designing computer system templates • Training event to inform GP/practice nurses of the template 	
Proposed Timeline:	
<ul style="list-style-type: none"> • Complete stakeholder meeting- first two months of placement • Template design and implementation– months three and four of placement 	
Action Plan: Meeting with clinical supervisor to discuss suitability of above changes.	

Note: Example pro forma adapted from Quality improvement for General Practice (p 58), by RCGP, 2015, London: RCGP