**PDSA Cycle [1]**

**Aim:** what are you trying to accomplish?

To improve the quality of fluid prescribing out of hours by providing a prompt to prescribing for junior doctors in the form of a fluid plan.

**Plan:** what will your test be?

Introduce our fluid stickers, as an aid to fluid prescribing on to the drug charts of an acute medical ward.

During our 3 month monitoring period, we found that only a minority of patients on intravenous fluids had a documented fluid plan. This was never more than 50% of patients on IV fluids, and often none.

**Prediction:** what do you think will happen as a result of your test?

We envisaged the number of patients with a documented fluid plan would increase and this would lead to safer fluid prescribing.

**Do:** what happened when you carried out your test?

We found that the majority of the fluid stickers had not been filled in.

**Study:** how did the results of your test compare with predictions?

With many of the fluid stickers not being filled in most patients did not have a documented fluid plan leaving them at greater risk of inappropriate fluid prescribing.

We also found that measuring urea and creatinine changes of the patients over the weekend was impractical, time consuming and difficult to interpret.

**Act:** how will you change your previous test in light of what you have learned?

We need to raise awareness of the fluid stickers so they can be filled in prior to the weekend. We simplified our measures, removing recording of biochemistry data.

**PDSA Cycle [2]**

**Aim:** what are you trying to accomplish?

Raise awareness of the fluid sticker and educate staff on how effective the intervention could be if it was filled in.

**Plan:** what will your test be?

We will send emails to the staff on the ward where our intervention is taking place. We will also target staff from other departments of the hospital by talking at foundation year doctor weekly teaching, the medical grand round, and the core medical trainee teaching programme. Ward nursing staff were involved in discussions regarding the aims of the project and gave positive verbal feedback.

**Prediction:** what do you think will happen as a result of your test?

This should increase the number of stickers filled in and go on to show how the fluid plan can make fluid prescribing more effective out of hours.

**Do:** what happened when you carried out your test?

There was a brief increase in use of the fluid stickers. However, use remained largely below 50%. Feedback was received regarding the large size of the sticker - taking up multiple prescription boxes and felt to be too cumbersome.

**Study:** how did the results of your test compare with predictions?

We were frustrated by the lack of use. However, explanations regarding charts without stickers, lack of availability of stickers (and convenience) and cumbersome size remained possible causes. A lack of willingness to adopt new strategies was an element for some clinicians, who felt added work would be created by the intervention.

**Act:** how will you change your previous test in light of what you have learned?

Improve the design of the sticker making it more visible and user-friendly to fill out.

**PDSA Cycle [3]**

**Aim:** what are you trying to accomplish?

Making the sticker more user friendly and visible by changing the design.

**Plan:** what will your test be?

To change the design of the sticker and place it more centrally. Bright, vivid colours were used and the image quality was improved.

All patient, rather than those already on IV fluids, had stickers placed on the next available prescription slow on their IV fluids charts.

**Prediction:** what do you think will happen as a result of your test?

Hopefully use will increase as availability and readiness of stickers will improve. The new brightly coloured sticker will be more easily seen, and the small size will although it to be placed neatly within the prescription box

**Do:** what happened when you carried out your test?

A brief spike in activity which was not (during the short measurement period) sustained each week.

**Study:** how did the results of your test compare with predictions?

Overall, use appeared to be gradually improving. There was however a stark lack of consistency between weeks, with different staff and significant patient movement over the weekend proving barriers to consistent sticker use.

**Act:** how will you change your previous test in light of what you have learned?

We now feel that the sticker is of a good design and there is awareness of it. We will now introduce the sticker onto the medical assessment unit in the hope it will aid fluid prescribing in patients who have just been admitted and are likely to be acutely unwell, potentially on IV fluids and may transfer to our intervention ward.

**PDSA Cycle [4]**

**Aim:** what are you trying to accomplish?

To try to further improve sticker use.

**Plan:** what will your test be?

Multiple patients on our acute ward on Monday had been transferred from the medical admissions unit (MAU) over the weekend. These patients were often on IV fluids. As we were not running the QIP on the MAU, these patients rarely had fluid plans. We began placing stickers on the MAU inpatient and blank fluid prescription charts. We also introduced a stamp with indications and cautions, to mark large quantities of blank charts rapidly.

**Prediction:** what do you think will happen as a result of your test?

We hoped this would further improve fluid plan use.

**Do:** what happened when you carried out your test?

The proportion of charts with the sticker in-situ did improve. However, whether they were used or not, remained variable. Throughout this entire period, of all the fluid plans made (n=23), all but one were followed (96%).

**Study:** how did the results of your test compare with predictions?

There remained challenges to our intervention. Rotating medical and nursing staff, practical limitations in ensuring the right prescription chart had a sticker at the correct time, and a reluctance to change working habits were all likely contributory factors.

However, when plans were made, they were in almost all cases, followed. This remains a significant “proof of concept” which remains a positive finding.

**Act:** how will you change your previous test in light of what you have learned?

QIP ended at this point. Electronic prescribing will be introduced soon and creating an IV fluid plan will be a part of this process.