Process Flow

Think QI
Step 1: Deep Dive

What?

The process flow tool enables you to record the time it takes to complete each step in a process. When the chart is completed it provides visual representation of the time and resources needed to complete a process e.g. support a patient through their pathway of care.

Why?

To understand how a process works in real time.

To identify bottlenecks which delay the flow of a process or pathway.

The tool can also be used after changes are made to understand the impact to the flow of the pathway/process now.

How?

1. **Process map the pathway -** be clear which process you want to map and why; this will help you to understand what the start and end point are. This is critical to ensure that you're focusing/measuring the right thing
2. **Prepare!**

   Observations - Agree with the team the length of time a process or pathway should be observed for. The timings and data gathered will be a snapshot of the process on that day, repeating observations on different days will provide a more comprehensive understanding of the process.

   Data collection - A data collection sheet can be used to record data such as: how many patients, appointment times, name of each step, etc.
3. **Observe the process/pathway** - use the data collection sheet as the template to record the timings. Record the timings for each agreed step on the template.

Want to learn more?

https://Process Metrics | Touch Time, Lead Time, Rework, Processing Time and Cycle Time explained |(6 mins)

Process Flow …. continued

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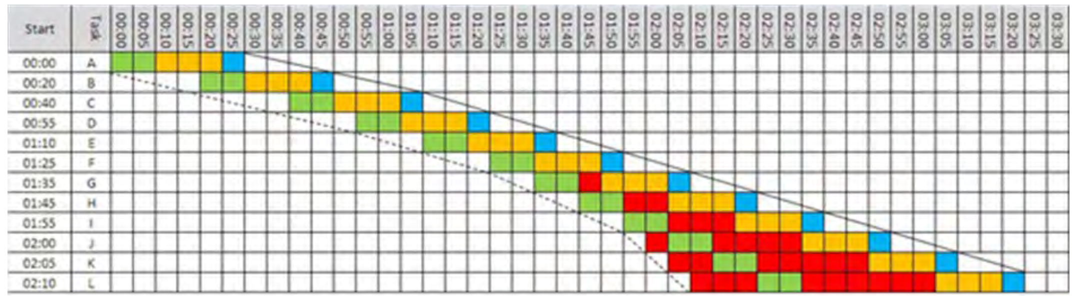
4. Populate the gantt chart - Transfer all information from the data collection template to an analysis template. An example of an Excel version is below:



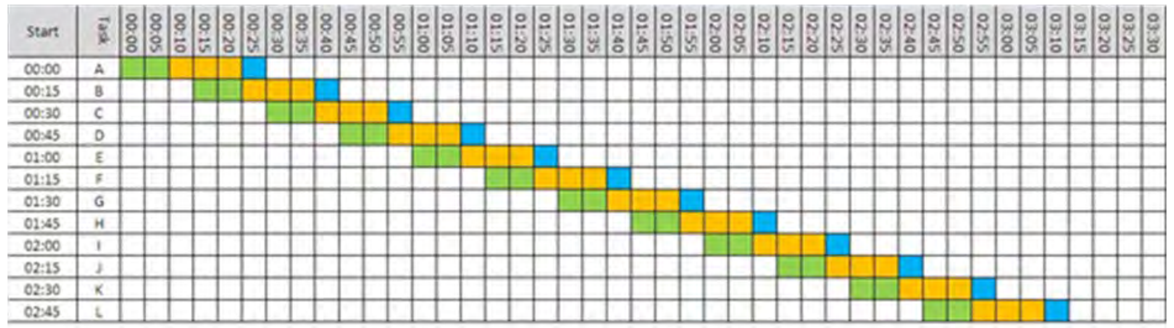
Grey waiting prior to the first process step. i.e. if a patient arrives at 8.50am for a 9am appointment the time interval bars will be grey until 9am.
Red = waiting/non-activity this can happen prior to the first process step or in between steps.
The timings recorded will provide the following information:
Cycle time = time to complete the step or task in a process.
Lead time = time to complete the entire process for each patient.

5. Analysing the results - *In the example provided in step 4 we can see the following* cycle times: Green = 10mins Yellow = 15mins Blue = 5mins
Lead time of the process = 30mins (10+15+5)

To ensure no waiting the schedule of appointments should therefore correspond with the **lead time** of the process. We shouldn't therefore be surprised that with this appointment schedule that patients arriving later in the clinic are kept waiting the longest. The slope of the left hand edge of the process indicates that patients are arriving faster and faster hence why this line appears steeper.
Tasks/patients are being pushed into the process at an increasing rate that is independent of the rate at which the process can work.

By comparing the arrival rate with each task's cycle time one step will be most exposed. This is called the **constraint step**, it is the step that controls the flow in the whole process. The cycle time for the 'constraint step' is the critical metric that determines the maximum flow in the whole process – irrespective of how many steps it has or where the constraint step is situated.

No queues will form if all appointments are pushed into the process slower than the 'constraint step' but this will however mean other tasks will be under-utilised. If we schedule appointments faster than the cycle time of the 'constraint step' then queues will begin to form, as we saw in the example above.
The optimum is when work arrives at the same rate as the cycle time of the constraint – this is called pull and it means that the constraint is used as the pacemaker to pull the work through.
The example below shows the process using this information to schedule the appointments.



In this example we can see that there is now spare capacity at the end for another task. This is called pull scheduling.
Most processes do not have exact cycle times for tasks, calculating the variability in the cycle times is the first step.

What next?

- With the team review the results – what is the data telling us?, how long does it take patients to move through the pathway?, where is our constraint step?
- Agree with the team how many other observations should be undertaken.
- Identify if further analysis is required – for example, are further observations required on the constraint step, in room observations to understand what is happening to cause the process to slow down.
- Discuss solutions that could be tested to improve flow. Use PDSA to test any solutions.
- Repeat the observation to do a comparison.