

Case Study

Optimising day surgery theatre utilisation by improving patient flow.

How much additional theatre capacity would be required to meet the forecast increase in patient demand? How well do we understand the drivers of current capacity? How could clinical services be delivered differently and so transform operating theatre utilisation thus reducing the need for additional capacity? How to balance the operational needs with both capital and operational budgetary constraints?

These were the questions asked by the hospital leadership team in the early stage planning process for a new regional day surgery facility. This case study explains how The Conclude Consultancy Limited (TCC) helped to answer these challenging questions.

Headline benefit: Initial analysis by the hospital leadership team identified the need to increase capacity from 10 to 14 day surgery theatres to meet forecast demand. Operational process optimisation by TCC analysis identified that a 90% probability that a maximum of 9 theatres would be required.

Forecast business benefits:

1. Occupancy Analytics strategies identified a corresponding opportunity to reduce 200 m² of forecast space requirements which would result in circa £0.8m / €0.9m / SEK8.3m capital expenditure savings.
2. Additional annual operational savings forecast to be £9.8m / €10.7m / SEK 102m.

The proposed regional surgery centre in Uddevalla in Sweden is on the site of the existing hospital campus. The regional strategy is to develop five such centres across the administrative region, and the centre at Uddevalla is to be the first of these.

Initial capacity studies by the day surgery leadership team

identified that the current capacity of 10 day surgery theatres would be insufficient to meet the new forecast demand, and that a further 4 theatres would therefore be required. However, the hospital management team was also concerned that the current process was inefficient, and sought to understand how it could be improved, and in doing so, to evaluate the potential impact on new theatre capacity.

The business risks

The business risk was that should over-provision of capacity be provided there would be significant long-term operational cost impacts that would be un-sustainable. Of equal concern would be an under-provision, meaning that there would be unmet patient demand, with a corresponding impact on human health and wellbeing.

The business challenge for TCC

It was this business challenge that TCC was asked to inform. The client wished to leverage TCC's unique 'Occupancy Analytics'TM

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methodology to analyse the forecast impact of different drivers on patient demand and operating theatre utilisation.

Working with the key stakeholders and supported by their Occupancy Analytics™ method and datasets TCC were able to help the stakeholders directly correlate different operational policy scenarios with the need for space.

The TCC methodology

TCC's methods are based on an achieving an open and direct dialogue with the clinical leadership team. Central to the method was an analysis of 12 months of operational data, which provided the evidence base for the potential improvement areas. The analysis was concerned with patient influx and how that flux comprising different patient types was managed through each stage of the process. TCC reflected on their findings with the leadership team and from these conclusions an intervention strategy was proposed.

Examples of key findings

Significant operational challenges in the existing facility arose from policies impacting patient influx. One of two major factors was that the Pre-assessment process allowed too many patients into the day surgery process and which subsequently involved unforeseen surgical complexities. This process factor resulted in significant variations in theatre procedure time. The lack of predictability influenced a second policy of restricting patient influx during the afternoon session. TCC analysis showed significant under utilisation (typically 10-40%

utilisation) of operating theatres during this period (lower in the afternoons than in the mornings).

A third factor concerned the use of operating theatres for the Pre-operative anaesthesia stage. The leadership team had decided that this would be much safer for the patient than having a separate anaesthesia suite. TCC analysis showed that this policy resulted in the equivalent of each theatre not being used for surgical procedures for one week in every four. This was identified as a potential candidate for further analysis and operational policy investigation.

Evaluation of the findings with the clinical leadership team

The leadership team recognised the clear benefits of managing the Pre-assessment process differently, and agreed to investigate this by reconsidering the screening criteria for day surgery.

TCC proposed process performance targets specific to each patient type. TCC hypothesised that this could be expected to result in improved predictability in the process for each patient type. Simulations demonstrated the potential for improvement and TCC recommended process trials to validate the potential of each improvement area relative to proposed targets.

Seeking opportunities for improved patient flow but balancing patients wellbeing needs.

The clinicians were concerned that optimised processes would treat patients like 'widgets' on a production line. TCC answered these

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concerns with the following principles:

- a) Processes would be optimised aligned to the specific needs of each patient type. Major patient types were Orthopaedic, Urology and General Surgery. Within these types there were two levels of patient sub-types.
- b) Operational policies to identify vulnerable patients and encourage pro-active support to them.
- c) Establish patient flow performance bands based on statistical analysis of current patient flux data for each patient type. From this analysis TCC identified both 10 and 90 percentile performance ranges and proposed that these should be tested in process trials.

To explain the application of these principles, it is important to understand how time that each patient is in process is managed. Some of this time is value added time, such as that for the clinical procedures, and other time relates to supporting patient wellbeing (such as counselling, and stress relief). Some of this is either waste, through process inefficiency or staff not being available when required, or uncontrolled time, such as unforeseen patient needs.

The latter issue is one that the clinical staff experience on a regular basis. These 'outliers' are significant variations to the distribution profile. TCC proposed a hypothesis that by categorising each patient (see above) as a patient type (rather than treating

them as one cohort), the process time for each stage could be optimised relative to each. TCC analysis indicated that the incidence of outliers (and with them the associated interruptions to patient flow) of over 150 minutes of theatre procedure time could be largely eradicated, with the remaining probability of a 1 in 10 day eventually of this arising.

Using this working hypothesis, TCC further proposed that patient influx could then be modified so that the distribution of each patient type could be balanced between morning and afternoon sessions. This would have two advantages over the current policies:

- a) Peak occupancy would be significantly reduced by 29%, which would be expected to result in improved patient and staff wellbeing. It would also bring space reduction benefits as well as capital and operational cost benefits.
- b) Theatre utilisation improved from 10%-40% to 50% to 70%, dependent on time of day. Further improvements in theatre utilisation would be possible by improved scheduling of patients influx using the proposed patient type designations.

To conclude!

The analysis by TCC identified that even with the larger forecast number of patients and by taking a view of risk factors, then it would be possible to reduce the number of theatres required to manage the process. However, a more conservative view of risk, particularly

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concerning the variability in the process, as well as the rejection of the proposal to remove the Pre-operative anaesthesia process from the operating theatres would be that more theatres would be required.

Ultimately the decision as to how many theatres should be developed would be a business decision for the hospital leadership team to make. TCC thus provides the risk analysis

and the data to support an informed decision in this regard. In doing so TCC does not seek to impose their values in this process, but to remain impartial to it, and to keep focus on objective analysis. This is illustrated in Figure 1 below.

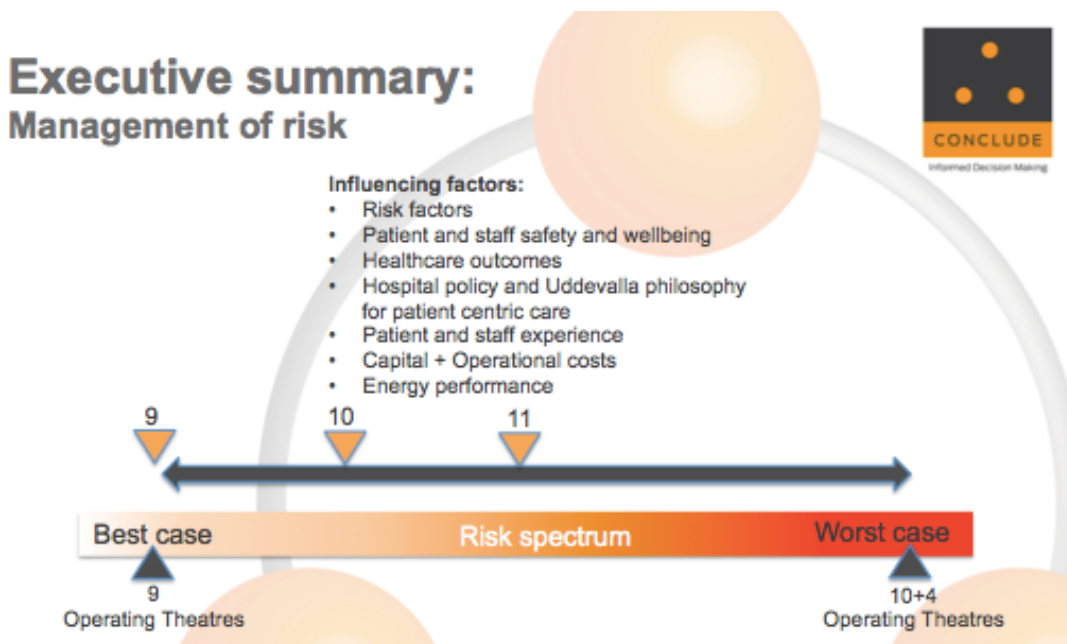


Figure 1 – TCC analysis informs the assessment of risk. Ultimately the hospital leadership team would assess the importance of different influencing risk factors.