IntelliMax

Case Study no 2019/09/02

Prostate Treatment Options and IntelliMax Analytics

Background

Prostate cancer is one of the most prevalent cancers treated in hospitals today and different treatment patterns are offered, sometimes with different results, costs and impacts on the patient. This Case study shows how the IntelliMax hospital business intelligence solution can help hospital managers and clinicians understand these cases better and to help deliver better value to the patient. We will show how identifying outliers in the data presented by IntelliMax Analytics can guide a decision maker to identify possible underlying issues – for example, issues related to the way prostate patients are treated.

Prostate cancer can be treated in several ways, the two more prominent ways being:

- Surgical removal of the prostate
- Chemotherapy treatment

Surgical treatment is predominantly a "once-off" process whilst chemotherapy may involve several iterative visits. Without trying to show any bias towards either of the two methods, we want to compare the cost of these two methods in this case study to assist hospital managers and clinicians to be informed about the cost impacts when they choose a treatment method.

About IntelliMax

IntelliMax is a sophisticated business intelligence system built for hospitals - and one of its major strengths is the fact that it has a fully integrated activity-based costing system that calculates the cost of any hospital object or process and allows this to be related to other performance parameters.

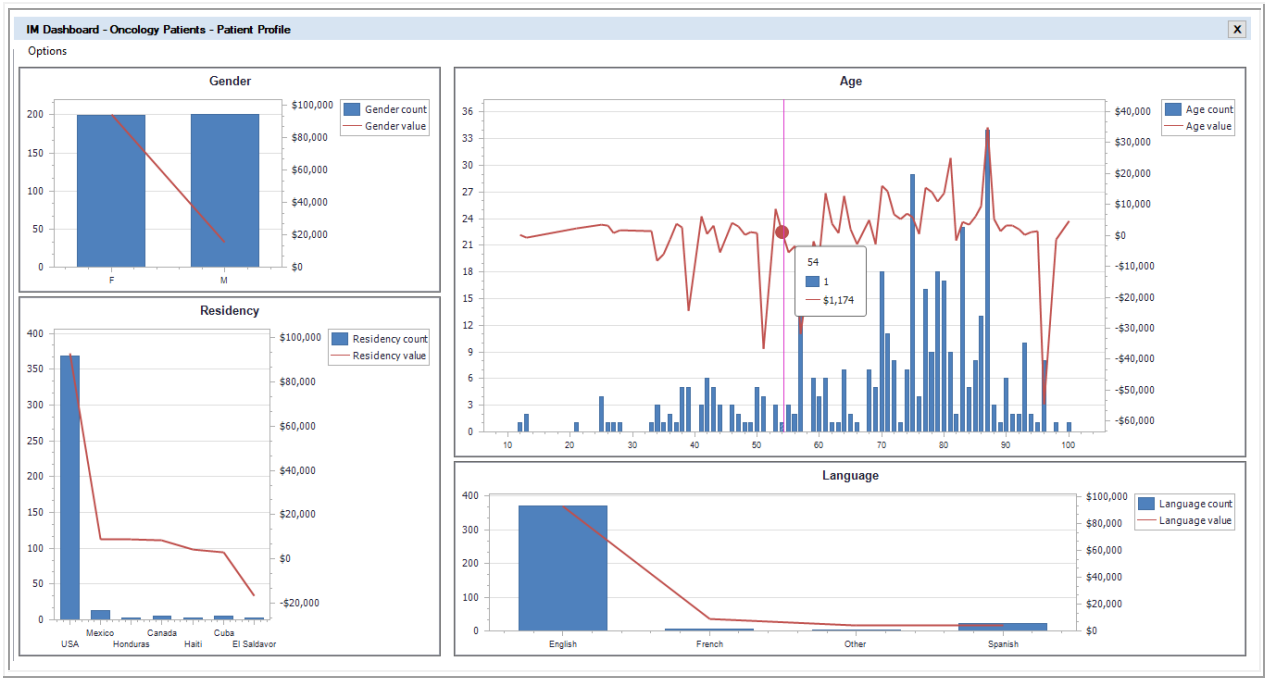
Below we will illustrate how IntelliMax can be used to get an in-depth understanding of the impact and cost associated with Prostate cancer treatment in a hospital.

Speciality: Oncology

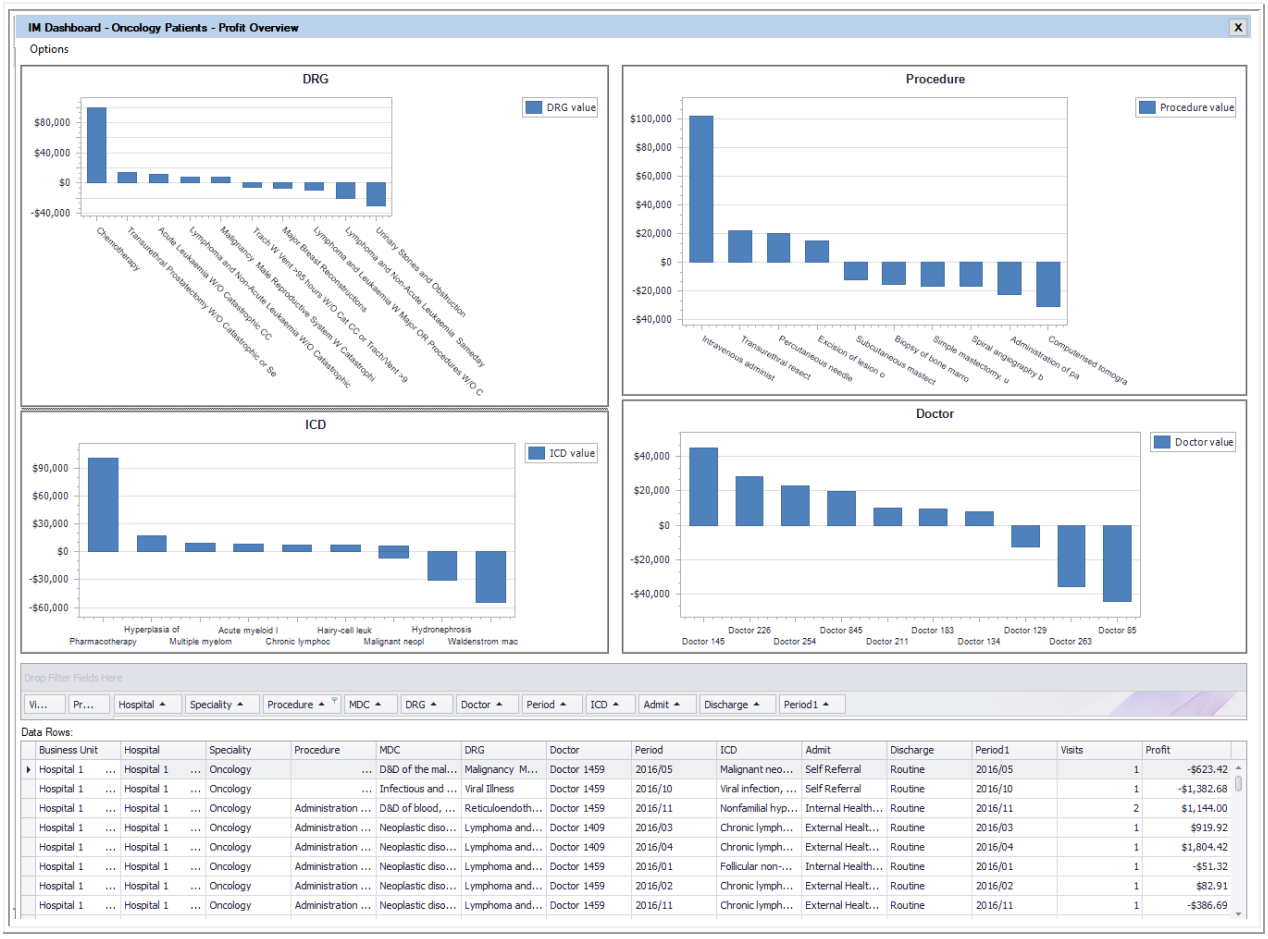
In order to understand the treatment of Prostate Cancer patients, we can start with an analysis of the Oncology department and Wards.

Firstly, a review can be done of the profiles of patients in the Oncology department. The Oncology Department treats a similar number of Male and Female patients, but most of the oncology patients are

older than 70 years, mostly from the USA, who have English as a first language - as can be seen in the dashboard below:



For our purposes, it's more interesting to consider the profit breakdown for the Oncology department, however - see the dashboard below:



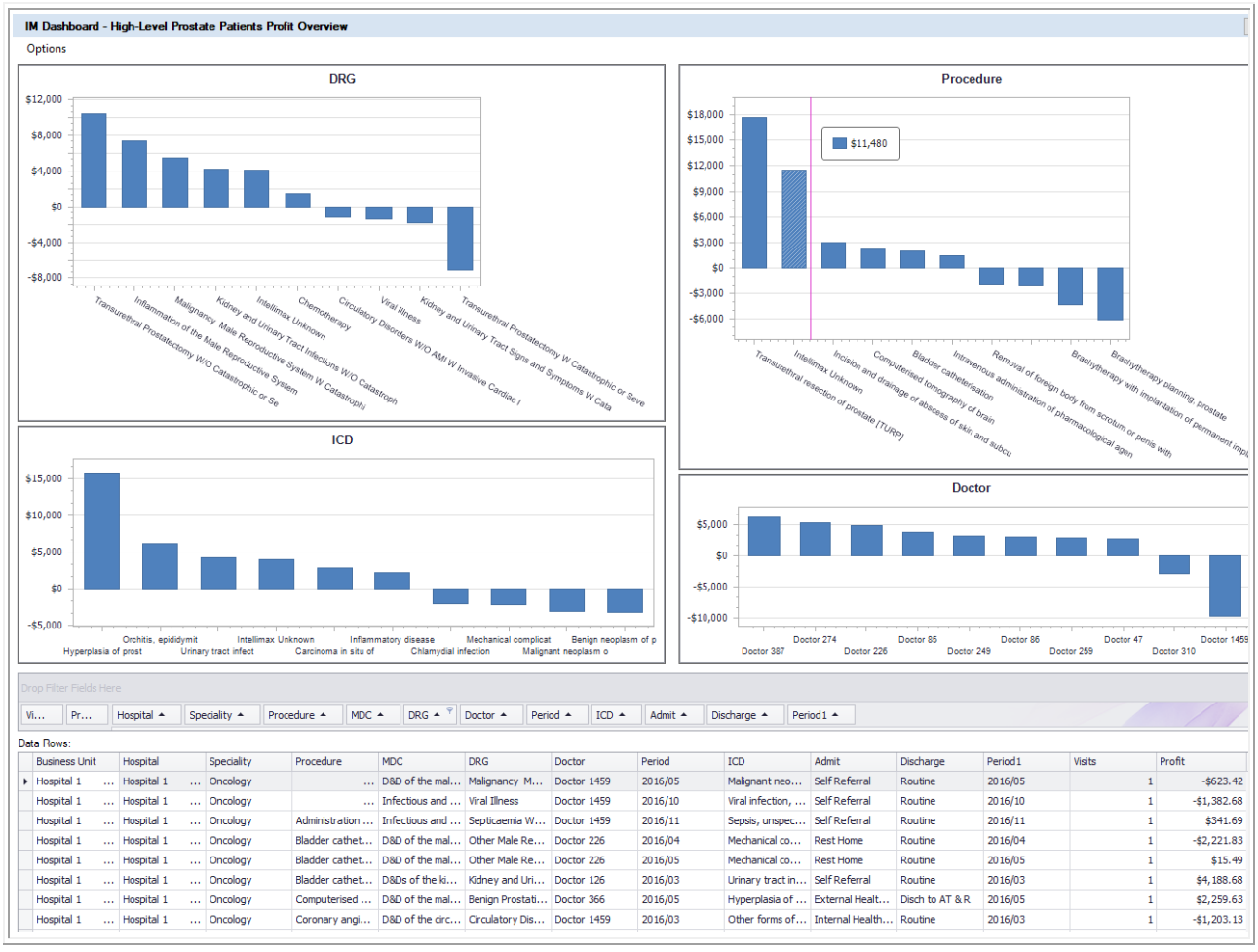
From the dashboard, it is evident that profitability varies considerably between various cases, procedures and doctors. Note that the most profitable DRG, by far, is "Chemotherapy" - with the Prostatectomy DRG (which is the next most profitable) a long way behind. This is odd, given that these two DRG's are both treatments for prostate cancer - so if there is a big difference in profits between the two kinds of treatment, then it would be good to understand why that would be the case.

It's interesting that some of the other DRG's (like the Lymphoma and Leukaemia-related ones) appear to be unprofitable, as are some procedures performed. It's also interesting to notice that only three doctors associated with Oncology are not profitable.

3. Speciality: Oncology: Prostate Patients

To address the first issue above, one would have to zoom in further, to look specifically at the Prostate Patients group. Prostate patients are classified as a specific “patient type” in IntelliMax, hence analyses with this group of patients can be done easily.

Consider the dashboard below for the review of Profits from Prostate Patients only:



Business Unit	Hospital	Speciality	Procedure	MDC	DRG	Doctor	Period	ICD	Admit	Discharge	Period1	Visits	Profit
Hospital 1	Hospital 1	Oncology	...	D&D of the mal...	Malignancy M...	Doctor 1459	2016/05	Malignant neo...	Self Referral	Routine	2016/05	1	-$623.42
Hospital 1	Hospital 1	Oncology	...	Infectious and ...	Viral Illness	Doctor 1459	2016/10	Viral infection, ...	Self Referral	Routine	2016/10	1	-$1,382.68
Hospital 1	Hospital 1	Oncology	Administration ...	Infectious and ...	Septicaemia W...	Doctor 1459	2016/11	Sepsis, unspec...	Self Referral	Routine	2016/11	1	$341.69
Hospital 1	Hospital 1	Oncology	Bladder cathet...	D&D of the mal...	Other Male Re...	Doctor 226	2016/04	Mechanical co...	Rest Home	Routine	2016/04	1	-$2,221.83
Hospital 1	Hospital 1	Oncology	Bladder cathet...	D&D of the mal...	Other Male Re...	Doctor 226	2016/05	Mechanical co...	Rest Home	Routine	2016/05	1	$15.49
Hospital 1	Hospital 1	Oncology	Bladder cathet...	D&Ds of the ki...	Kidney and Uri...	Doctor 126	2016/03	Urinary tract in...	Self Referral	Routine	2016/03	1	$4,188.68
Hospital 1	Hospital 1	Oncology	Computerised ...	D&D of the mal...	Benign Prostati...	Doctor 366	2016/05	Hyperplasia of ...	External Healt...	Disch to AT &R	2016/05	1	$2,259.63
Hospital 1	Hospital 1	Oncology	Coronary angi...	D&D of the circ...	Circulatory Dis...	Doctor 1459	2016/03	Other forms of...	Internal Health...	Routine	2016/03	1	-$1,203.13

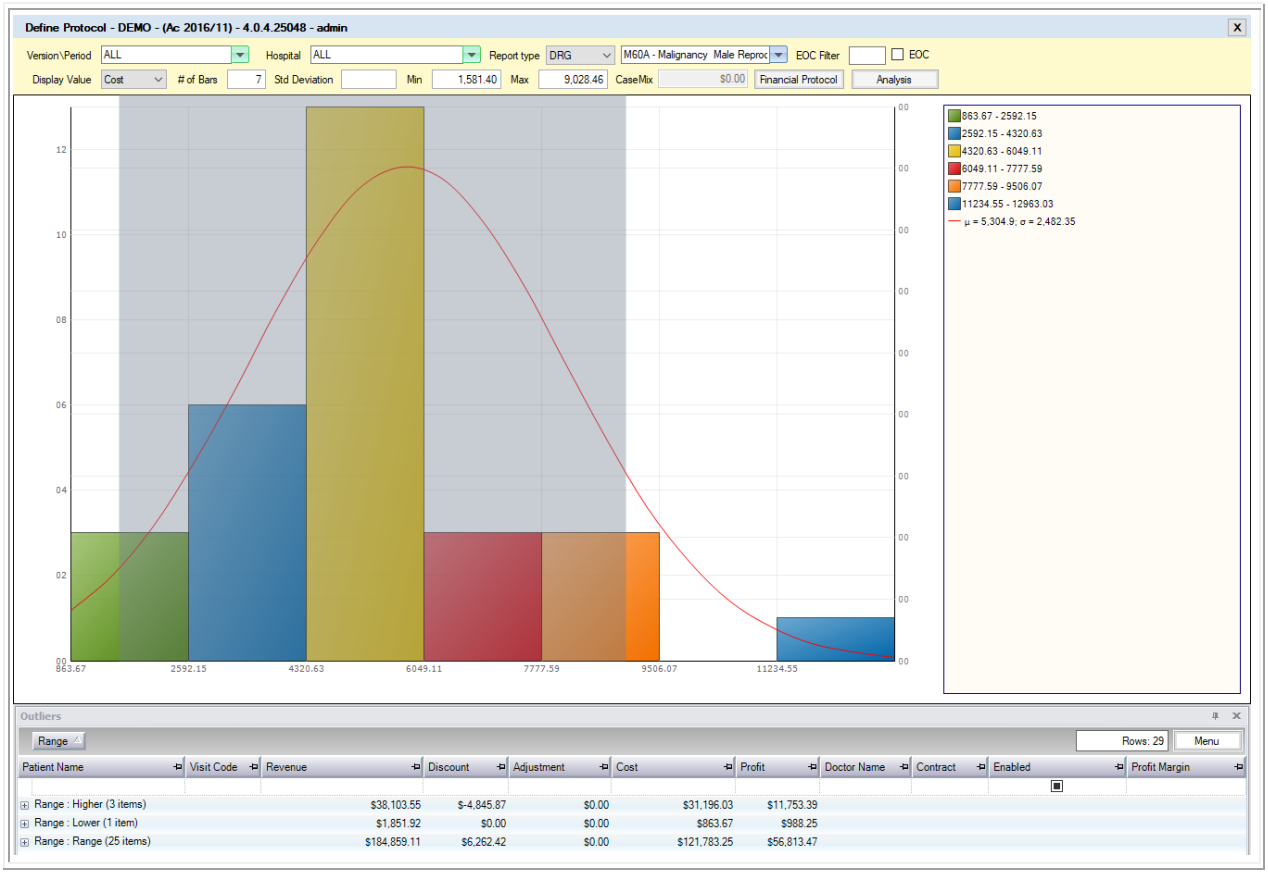
Note that for this group, the Chemotherapy DRG is not the most profitable; in fact, it looks as if total profits from Chemotherapy is ranked 6th, while Prostatectomy appears to be the most profitable DRG in this group. This is clearly different from the profile of all Oncology patients (which we saw in the dashboard above) - this is an unexpected result, which may warrant a closer look at the profitability of treating Prostate Patients with Chemotherapy versus Prostatectomy.

4. Profitability analysis of Prostatectomy vs Chemotherapy for Prostate Patients:

For Case analysis, IntelliMax provides a “Financial Protocol” to summarize all the cases for one specific DRG or Principal procedure. The Financial Protocol provides the full distribution of costs of all patients for the selected DRG or Procedure. It also shows the Median value ($5,304) of the cases as well as a selected number of standard deviations from the median (see the grey area which is $5,304 +- $2,482) and then allow a drill-through to all outliers to the left or right of the distribution. All outliers above (and below) the range are listed below the diagram.

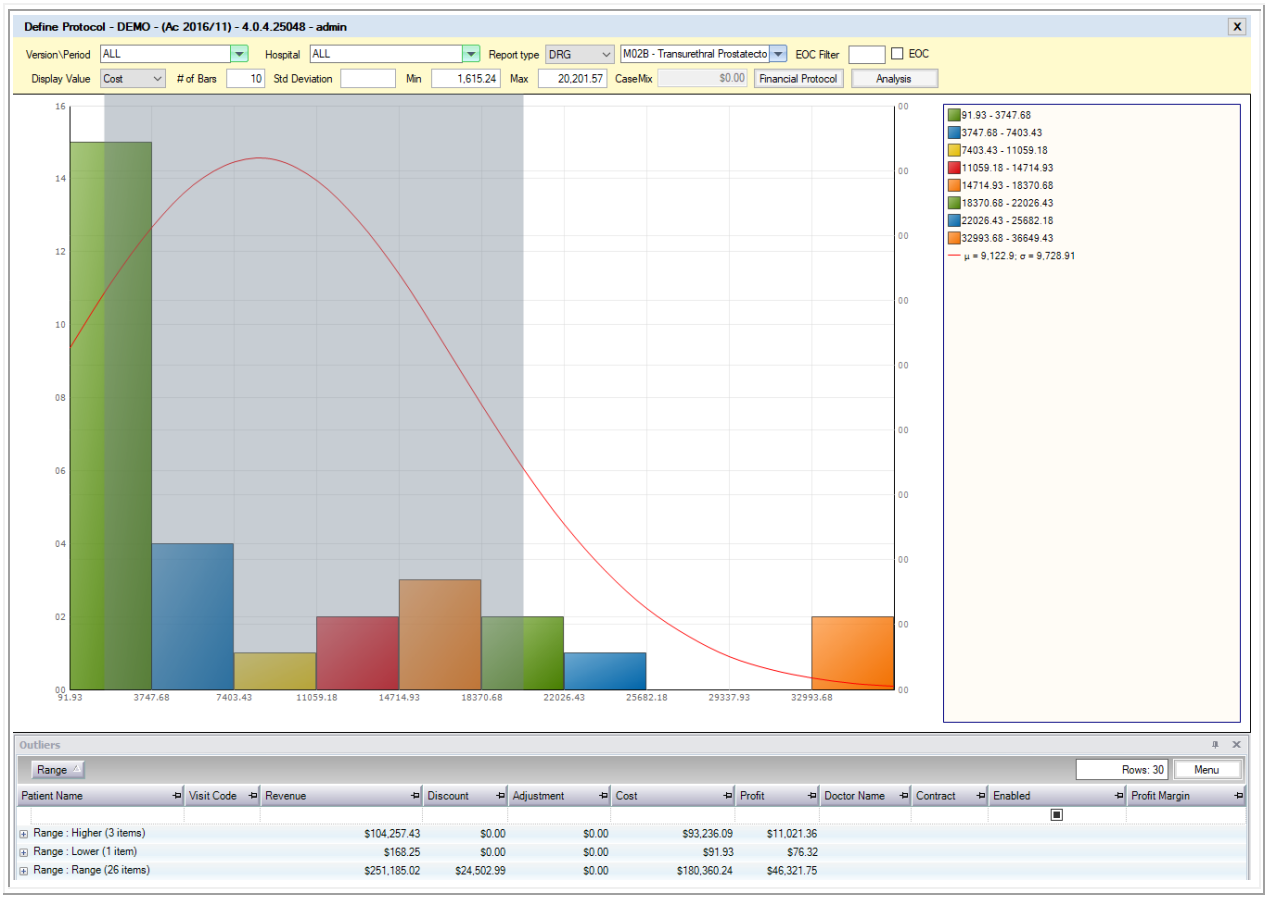
The following shows the distribution of costs for the cases where a prostatectomy was performed:

4.1 M60A - Malignancy Male Reproductive System W Catastrophic or Severe CC



- Note that the median cost for this DRG was approximately $5,304**,** and that there were three outliers in costs, one case where the cost was $11,234 or more (Basically double the cost of the norm).

4.2 M02B - Transurethral Prostatectomy W/O Catastrophic or Severe CC

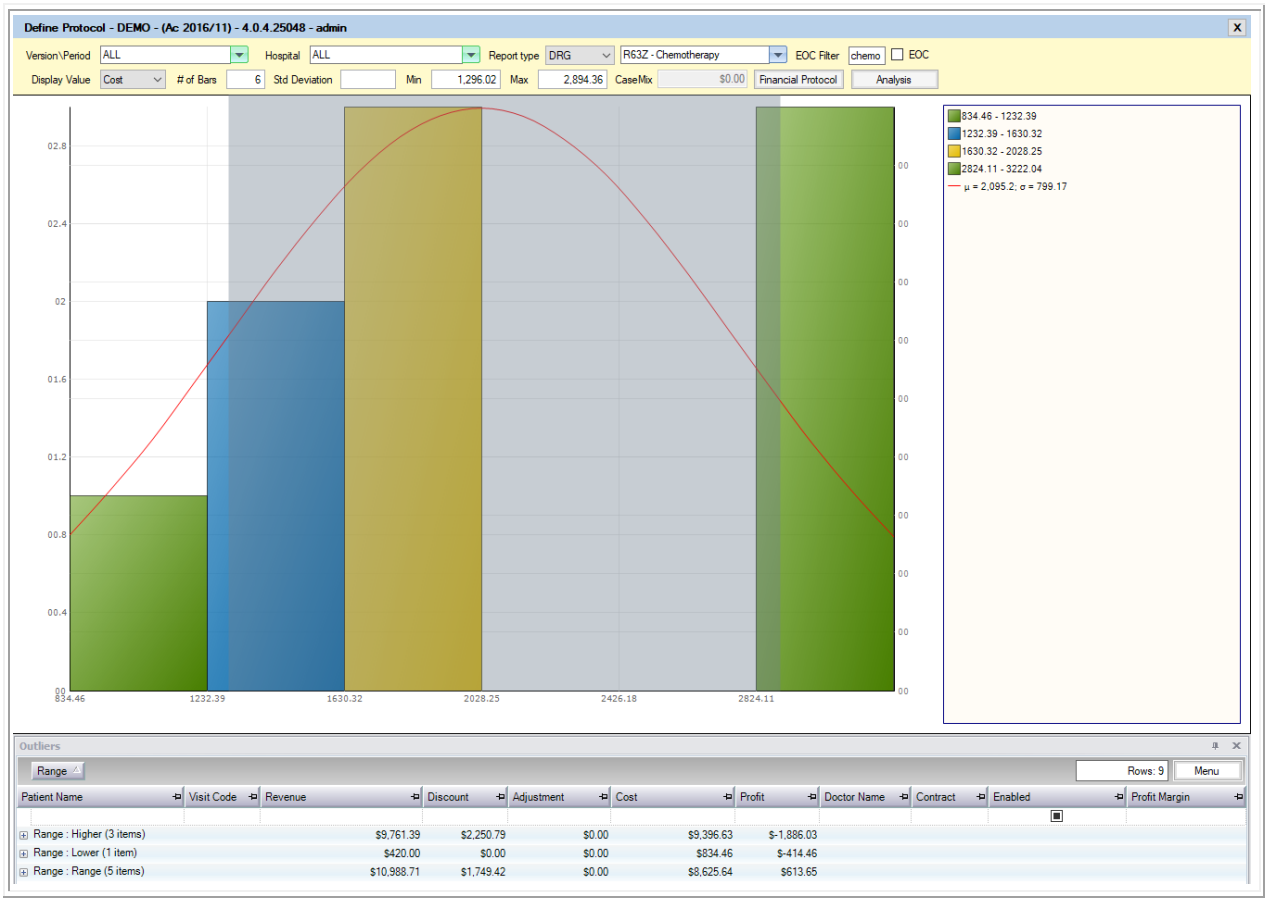


- Note that the median cost for this DRG was approximately $9,122, and that there were three outliers in higher costs, which varied in cost between $22,151 and $36,649.

On the other hand, the following shows the cost distribution for Prostate patients where the treatment method was Chemotherapy**:**

4.3 R63Z – Chemotherapy

From the Financial Protocol below it can be seen that the average cost of treating Prostate patients with Chemotherapy is considerably cheaper that with surgical procedures and obviously, clinical factors also need to be considered for this analysis - but this does give a perspective on the relative cost.



Note the median cost for this DRG was $2,095, but there were outliers where the cost varied between $3,030 and $3,221.

5. Conclusion

For Prostate Patients, there is a higher proportion of high-cost outliers for Chemotherapy than for the surgical treatments. Chemotherapy treatments would also require multiple visits, which will increase the total cost.

This may help explain why doctors in the Oncology department are opting for surgical treatments - it may be that doctors prefer the predictability in costs we can see in the surgical treatments over the higher chance of escalating costs we can see in the case of Chemotherapy. Even though the surgical costs are higher than those of Chemotherapy, they are more predictable.