EE418

# Cost-Utility Analysis of Ferric Derisomaltose versus Ferric Carboxymaltose in Treating Iron Deficiency Anemia in Norwegian Patients with Inflammatory Bowel Disease

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## Background

In Norway, the incidence and prevalence of IBD is among the highest globally.[1] The recently-published European Crohn's and Colitis Organisation (ECCO) guidelines reported anemia as one of the most frequent extraintestinal manifestations in IBD, with iron deficiency anemia (IDA) as one of the most common causes.[2] In the treatment of IDA, ferric carboxymaltose (FCM) and ferric derisomaltose (FDI) are preferred intravenous (IV) iron formulations, both which produce similar hematological response rates in patients with IBD and IDA. However, FCM can result in higher rates of hypophosphatemia than FDI.[3]

With Norway having amongst the highest reported incidence and prevalence rates of IBD globally and given the impact of IDA in patients, a comparison of treatment options is needed. Given the recently published results from the PHOSPHARE-IBD trial, a cost-utility analysis incorporating the results would be advantageous for a comprehensive evaluation of the cost-utility of FDI versus FCM in patients with IDA and IBD in Norway.

The objective of the present study was to therefore evaluate the cost-utility of FDI versus FCM in patients with IDA in Norway.

## Methods

A previously-published patient-level simulation model was used to evaluate the cost-utility of FDI versus FCM from the Norweigian national healthcare payer perspective. This patient-level simulation model was selected over a cohort-level model as it included patient-level heterogeneity, first-order uncertainty, and stochastic variation at the parameter level.[4]

The PHOSPHARE-IBD RCT trial was used to model iron need, incidence of post-infusion hypophosphatemia and disease-related quality of life (QoL).[3] SF-6D utility values were used to evaluate the differences in QoL between patients treated with FCM and FDI.[3,5]

Patients in the model were assigned baseline values for hemoglobin, age, and body weight, which were independently sampled from baseline distributions. These values were used to determine the average iron requirement and the number of treatment courses needed per patient per cycle.The costs and QoL "process" utilities associated IV iron administration were calculated based on the number of infusions given per treatment course.

Outcomes such as quality-adjusted life years (QALYs), survival, and costs in 2023 Norwegian Krone (NOK) were calculated and summarized for all modeled patients, separately for FCM and FDI. These outcomes were then used to determine an incremental cost-utility ratio (ICUR) and net monetary benefit (NMB) for FDI compared to FCM. The analysis was conducted over a five-year time horizon using a Norwegian national payer perspective, with a discount rate of 3% applied for future costs and effects. A willingess-to-pay threshold of NOK 25,000 was used.

## Results

### Base case results

FDI yielded iron infusion-related cost savings of NOK 4,506 (Table 1), as patients receiving FDI needed 1.52 fewer iron infusions than patients treated with FCM (Table 2). Due to the need for patients treated with FCM to have phosphate testing an additional cost was required for FCM; a further cost saving of NOK 1,735 was observed in FDI patients (Table 2). The combined cost saving for patients on FDI compared to FCM was NOK 6,241. An increase of 0.075 QALYs was also observed in FDI patients when compared to FCM patients likely due to the reduction in infusions and phosphate testing needed in FDI patients (Table 1).

**Table 2. Treatment characteristics and costs**

| Category | FCM | FDI |
|---|---|---|
| Total iron treatment courses | 3.96 | 3.96 |
| Total iron infusions per patient | 7.20 | 5.68 |
| Calculated iron need per patient (mg) | 6,112 | 6,126 |
| Mean infusions per treatment course | 1.82 | 1.43 |
| Iron administration costs (NOK) | 21,342 | 16,836 |
| Phosphate monitoring costs (NOK) | 1,753 | 0.00 |

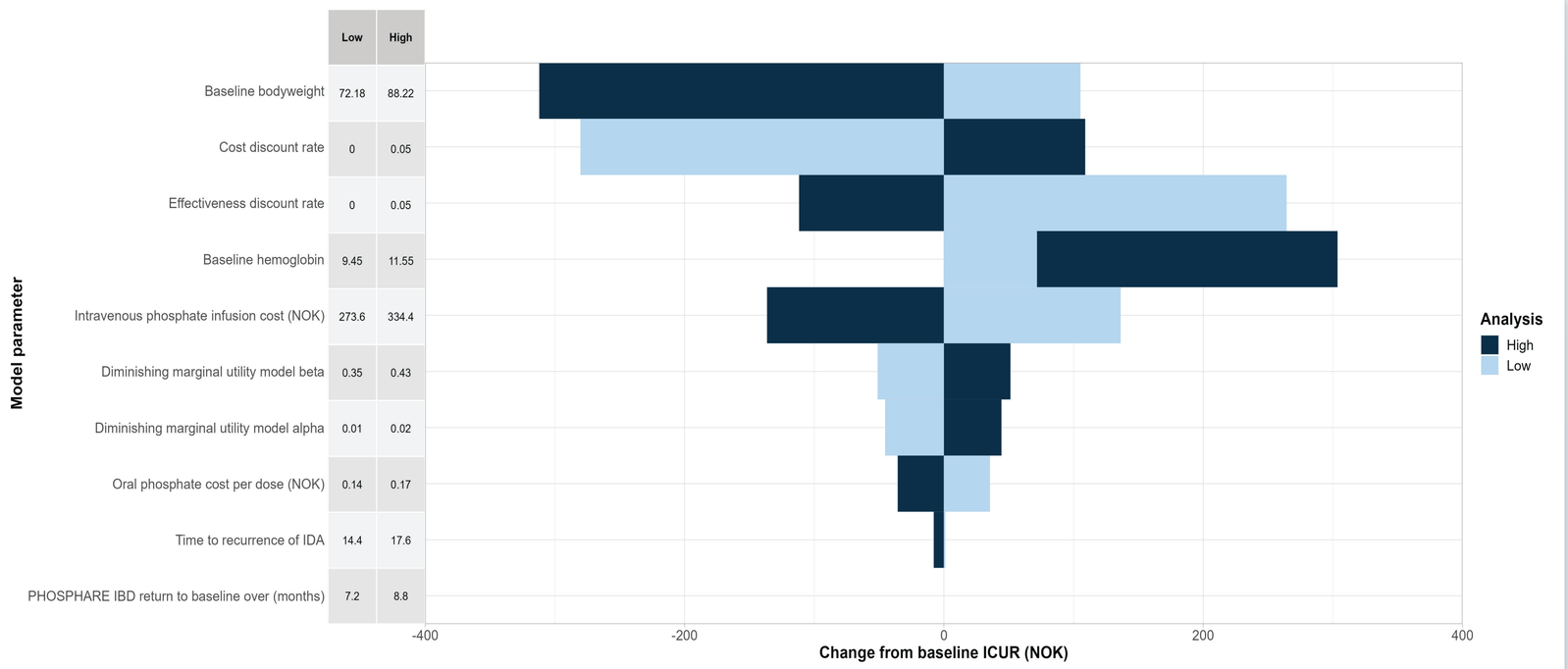
**Abbreviations:** FCM, ferric carboxymaltose; FDI, ferric derisomaltose; mg, milligrams; NOK, Norwegian Krone.

### Sensitivity analyses

A series of one-way sensitivity analyses (OWSA) was conducted to determine the most impactful parameters on the basecase ICUR. Results from the OWSA are presented in Figure 1 as a tornado diagram. Baseline bodyweight had the greatest impact with a lower bodyweight of 72.18 kg increasing the ICUR by NOK 105 per QALY and a higher bodyweight of 88.22 kg reducing the ICUR by NOK 312.03 per QALY. The cost discount rate also had a significant impact on the final ICUR, with a discount rate of 0.00% reducing the ICUR by NOK 280.24 per QALY and a discount rate of 5% increasing the ICUR by NOK 109.03 per QALY.

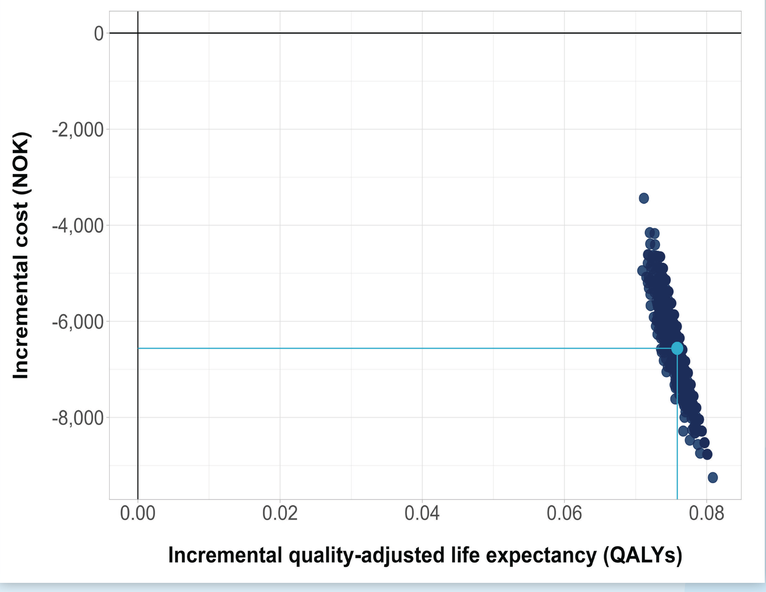
In the probabilistic sensitivity analyses, all ICURs fell within the south-eastern quadrant (representing reduced costs and QALY-gains) of the cost-utility plane, showing consistent dominance for FDI (Figure 2). At all WTP thresholds between NOK 0.00 and NOK 50,000 per QALY, there was a 100% likelihood of FDI being the cost-effective treatment strategy.

**Figure 1. Tornado plot of one-way sensitivity analysis results**




**Abbreviations:** ICUR, incremental cost-utility ratio; IDA, iron deficiency anemia; NOK, Norwegian Krone.

**Figure 2. Results from the probabilistic sensitivity analysis**




**Abbreviations:** NOK, Norwegian Krone.

**Table 1. Health economic results from the base case analysis**

| | Life expectancy (years) | Quality-adjusted life expectancy (QALYs) | Cost (2023 Norwegian Krone) |
|---|---|---|---|
| **Base case (Norwegian national payer perspective)** | | | |
| Ferric carboxymaltose | 4.940 | 2.594 | 23,077 |
| Ferric derisomaltose | 4.940 | 2.670 | 16,836 |
| **Incremental (ferric derisomaltose)** | **±0.00** | **+0.075** | **-6,241** |

## Conclusions

FDI was cost saving when compared to FCM in the treatment of patients with IBD and IDA in Norway.

Cost savings were driven by a reduction in the number of iron infusions needed with FDI versus FCM and the lack of phosphate monitoring required with FDI.

FDI was also associated with improved quality of life. These results support FDI as the economically preferable IV iron formulation in Norweigian patients with IBD and IDA.

### References

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