**Analysis of “cost drivers” for health care services use in cystic fibrosis patients: the experience of the Milan Cystic Fibrosis Center**

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**Objectives:** To identify and model – from the perspective of the NHS – the main “cost drivers” for health care use in CF patients, to facilitate a more rational management of resources and a better understanding of the economic impact of the introduction of new treatments.

**Methods:** The dataset used for this study was the one collected by Colombi et al. [Adv Ther s 12325-013-0008-5 (2013)], which includes 165 consecutive patients seen during the period March–July 2009 at the CF center of Milano (Lombardy) and followed for one year. Nineteen anamnestic and treatment related parameters were tested as explanatory variables for the total yearly cost(s) of the patient borne by the NHS. The analysis was performed by means of multivariate L5 regression.

**Results:** The best fitting model ($r^2 = 0.73$; adjusted $r^2 = 0.71$) was as follows: Log(total cost) = 9.485 + 0.657 (pancreatic sufficiency) − 0.013 FEV1 + 0.950 (use of dornase) + 0.931 (use of inhalatory antibiotic maintenance treatment) + 0.029 (age at diagnosis) − 0.377 (meconium ileus). The $p$ value for the intercept and the first 4 parameters was $<0.0004$, for the last two was $<0.07$.

**Conclusion:** Some of the findings are essentially in line with what was previously reported by similar studies, even though the impact of dornase on the cost seems less relevant ($r^2 = 0.64$ without dornase). Other parameters (such as for example gender, BMI, age, age at diagnosis and a positive history for meconium ileus), which in the studied population seem to have a different relevance, warrant further analysis and investigations.

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**Improving CF inpatient admissions using a value stream mapping approach**

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**Objectives:** Cystic Fibrosis admissions are challenging, often there is a mismatch between patient and staff expectations of service. Historically hospitals have evolved processes of service delivery, rarely reviewed for value to patients. The aim of this project was to systematically identify improvements to admissions.

**Method:** The Value Stream Mapping approach requires that a process has a clear start and end point, in this case: the time from the decision to admit a child to the discharge report. Within that journey each contact with the patient is mapped, using a core group of stakeholders, including professionals and parents. For each mapped event 1. the parents describe the purpose of that event and rate service received as – satisfactory, dissatisfactory or a delighter (beyond expectations), referred to as the “voice of the customer”.

2. The health professional (HP) is asked, what they do, why, barriers, and effective use of skills.

Verbatim interviews of 7 parents and all HP’s were transcribed and reduced to overlapping themes using thematic analysis.

**Results:** Along the parent journey, 6 events were identified as satisfactory, 6 as delighters, and 8 as dissatisfying. Staff identified 8 events needing improvement. Four distinct areas of overlap were identified; pre-admission, day of admission, daily routine and discharge. Core-working groups were set up to implement changes.

**Conclusion:** The changed inpatient pathway will be evaluated with the same methodology in 6 months. A business evaluation methodology lends itself to medical service delivery and can identify both valuable and stress-inducing areas of service provision to improve use of resources.