Improving clinical access to mental health services in the NHS – the application of Lean thinking

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Summary
This paper serves to disseminate findings from implementing Lean in a clinical decision-making service function in a NHS Trust. Operational and performance disparities were identified within the Trust's service access points, causing inconsistent processes, poor use of staff resources, and service quality variability.

An action research project was designed and research propositions were developed from the literature. We sought to understand the extent that operational performance can be improved following Lean implementation and how it impacts upon clinical decision-making. One of the authors was embedded within the organisation, allowing access to core data and appropriate staff resource. Data collection was achieved through interviews, questionnaires, in-house performance metrics analysis and observations. Lean tools were considered and adapted, then applied with the aim of removing wasteful processes, standardisation and consolidate gate-keeping processes. The effectiveness of Lean implementation was evaluated to determine operational/performance improvements and to capture defined cost/financial benefits and savings.

Track: Performance Management

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Introduction

This paper will report on a service improvement project within a National Health Service (NHS) Trust that provides mental health services in the North of England (the Trust). The study will focus on a review of the operational processes and performance of the Single Point of Access service (SPA) - the gateways for patients into the Trust's services. The study will demonstrate the applicability of Lean in a clinical decision-making service function within the health sector; providing greater understanding on how Lean implementation can improve operational performance and its influence on the quality and effectiveness of the clinical decision-making process.

Background and purpose

In January 2013, one of the authors was appointed as a Strategic Improvement Project Manager within the Trust, with the initial primary task of reviewing the patient gateways into the Trust's services known as Single Points of Access (SPA). The Trust had recently undergone significant growth and structural changes which resulted in the creation of four Business Delivery Units (BDUs). These BDUs are responsible for the delivery of mental health services for the population within their respective geographical area. Although they are part of the same organisation, the BDUs are allowed a degree of autonomy in the way they deliver their services. However, this has led to differences in operational processes between the BDUs, resulting in the perception of inconsistent levels of service quality and performance across the Trust. As a result, the Trust commissioned a series of Service Reviews in an effort to identify and eliminate inefficient work processes through the use of Lean concepts. It is anticipated that the Reviews will deliver cost savings whilst improving quality, as well as bring about consolidation and standardisation amongst the BDUs.

Although it is part of a larger, organisation wide Service Review, this study will report on one specific function - the SPAs at each of the four BDUs (the case study sites). The primary function of the SPAs is to gate-keep admissions into the Trust's mental health services, and serves as the triaging interface between referrers and the treatment team (Birmingham Community Healthcare, 2013; NHS Humber, 2013). It can be considered that SPAs are a Lean concept themselves in that it aims to minimise and eliminate duplication of processes through consolidation to achieve i) simplified, seamless access pathway for referrers and patients to the right treatment services; ii) better response times for assessment and treatment; iii) eliminate referral and assessment duplications; iv) standardise information and work processes; and v) increased service quality and efficiency (Department of Health, 2010; Gallimore et al., 2009; Harmoni, 2013).

However, the Trust has recognised that due to the autonomy of its BDUs, there were significant differences in the operational structure, resources, capabilities and capacity within the four SPAs. Table 1 outlines several examples of operational variations between the SPAs. The differences have led to a number of problems which include:

- Unclear and poor understanding of the role and function of SPA amongst staff
- Inconsistent use of staff resources
- Increased pressure on downstream treatment teams to compensate during SPA downtimes
- Increased patient waiting time due to incorrect allocation to treatment teams

	SPA 1	SPA 2	SPA 3	SPA 4
Role	Triage	Triage, assessment, brief intervention, bed management	Triage	Assessment and brief intervention
Hours of operation	9:00 – 17:00 Mon to Fri	24 hours	8:30 - 17:00 Mon to Fri	24 hours
Direct contact with patient	No	Yes	No	Yes

Table 1: Operational variations between the four SPAs at each BDU (Adapted from Flower, et al., 2012)

Furthermore, Table 2 shows the most recent data for access to services reported by the Trust to CQUIN (NHS Institute for Innovation and Improvement, 2012). It indicates that the Trust is failing to meet best practice targets for service access but it does not provide sufficient detail to determine the extent of the failings. This reinforces the impetus of the study and the importance of ascertaining the root causes of these difficulties in order to devise and execute improvement measures accordingly.

CQUIN Report 2011/12						
			Target met (Y/N)			
Indicator and criteria	**Description**	**Target**	**Q1**	**Q2**	**Q3**	**Q4**
1.1 Improving access for people experiencing acute mental health problems (referral to treatment team within 4 hours)	a. Young people services :Urgent referrals b. Adult services: Urgent referrals c. Older people services: Urgent referrals	a. 85% b. 85% c. 85%	**N**	**N**	**N**	**N**
1.2. Improving access for people experiencing non-acute mental health problems (referral to treatment team within 14 days; start of treatment within 6 weeks)	a. Young people: Non-Urgent referrals b. Adult services: Non-Urgent referrals c. Older people services: Non-Urgent referrals d. Young people: Start of treatment e. Adult services: Start of treatment f. Older people services: Start of treatment	a. 65% b. 65% c. 65% d. 95% e. 95% f. 95%	**N**	Y	**N**	**N**

Table 2: The MHT's CQUIN performance data 2011/12, for access to mental health services indicators (NHS Institute for Innovation and Improvement, 2012)

The study will build upon the work of three previous knowledge transfer projects (Bamford et al., 2009; Dehe et al., 2011; Zhang et al., 2012) which implemented Lean thinking and processes to improve NHS logistic operations and optimise strategic decision-making processes respectively. Improvements were made using a variety of techniques associated with Lean such as the Balanced Scored (BSC), SWOT and PESTLE analysis, Quality Function Deployment (QFD), benchmarking activities, measurement frameworks, and decision making modelling using Analytical Hierarchy Process (AHP) and Evidential Reasoning (ER). These projects demonstrated the importance of implementing and disseminating appropriate models to support strategic decision making processes,

which subsequently led to savings for the NHS in terms of time and cost, as well as establishing best practice for use elsewhere. Other Operations Management theory will also be drawn upon to gauge the levels of Lean practice within each of the SPAs, such as the framework developed by Safayeni et al. (1991). Discrepancies between the case study sites can be investigated and the relationship between different levels of Lean implementation and performance can be explored. These findings could be used to inform strategic decision making in terms of focussing improvement efforts and diverting resources to underperforming sites, as well as provide an opportunity for internal knowledge transfer.

Literature Review

An initial literature review was carried out and identified a number of key themes associated with the application of Lean in healthcare, as well as providing further justification for this study:

- Studies were predominantly situated within surgical department (Mandahawi et al., 2011; Meredith et al., 2011; Schwarz et al., 2011; Al-Hakim and Gong, 2012; Ferrari et al., 2012), laboratory settings (Papadopoulos et al., 2011; Graban and Swartz, 2012), and Accident and Emergency departments (Dickson et al., 2009; Jones et al., 2012).
- The main types of wastes arose from waiting and inappropriate processing of patients.
- Main benefits following the implementation of Lean were reduced waiting times, smoother and improved work flow and reduced production variation.

This provides evidence of a positive connotation to Lean application in the health sector and reinforcing Joosten et al.'s (2009) assertion of its relevance in a service setting. It was noted that Lean application within a mental health service environment was lacking with only two papers identified thus far (LaGanga, 2011 and Radnor, 2011). As such this study can contribute to the knowledge base by situating the research within a relatively unfamiliar case study setting. Furthermore, the literature review revealed biasness towards case studies using departments with clearly defined process flows such as surgical and A&E. This study differs in that the focus is upon a clinical decision-making service function with ambiguous processes, and as such, the findings could provide evidence in Lean implementation and performance within a new context.

Ultimately, the study will provide an insight into the effectiveness of existing Lean dissemination efforts within the organisation; providing greater clarity into business processes, develop best practice models and procedures, improve healthcare service provision, and influence policy decision making by linking healthcare strategy and models for service integration. As a result, the following research questions have been developed for this study:

RQ1: *How can SPA operational performance be improved through the implementation of Lean within this organisation?*
RQ2: *How does the application of Lean affect the clinical decision-making process?*

Methodology

The study followed an action research methodology such as that used by Zhang et al. (2012), Bamford and Chatziaslan (2009), and Bamford et al. (2009) in their studies of operations management within the NHS. As part of an ESRC knowledge transfer arrangement between the Trust and the Academic Institution, the researcher was employed by the Trust for a one year period in a service research and improvement role. A number of academic partners were also closely involved to provide supervision and professional guidance. With the researcher embedded within the Trust on a day to day basis, the research team had full access to data and personnel across the organisation. This allowed for the collection of relevant and high quality data during the research period. A mixture of interviews, questionnaires, secondary data (obtained from the Trust's in-house performance and information function) and observations were used to collect the data required.

Case studies

Four SPAs within each of the BDUs were identified as the case study sites. It is understood that at present each of the SPAs are autonomous with their own set of operating procedures. Drawing upon Lean tools and techniques, a bottom-up approach was used to devise a current Value Stream Map (VSM) for each of the sites to understand the operational issues associated with the different SPA models. This was driven by purposive sampling through engagement with relevant stakeholders (Referrers, SPA employees, Recipient treatment teams). The rationale being that these stakeholders had the relevant background and/or experiences to provide the appropriate data (Jankowicz, 2005) required to inform the VSM. Furthermore, Stuart et al. (2002) argue that direct involvement with people to understand their everyday life analytically was important in case-based research. The qualitative data was supplemented by quantitative data in the form of secondary performance data. The extant literature provided evidence that researchers in Lean healthcare incorporated a mixture of quantitative and qualitative components in their studies (Castle and Harvey, 2009; Herring, 2009; Wojtys et al., 2009; Radnor, 2011; Schwarz et al., 2011; Esain et al., 2012; Morrow et al., 2012), which reinforced the appropriateness of this approach. Furthermore, these studies also included VSM as one of their investigative tools which justifies the selection of this instrument for this study.

Initial Results

The secondary quantitative data that was used to establish baseline operational performance of each SPA is shown in Table 3, with initial data populated where available. It has thus far revealed variations in service demand ranging from 12 to 29 referrals per 1,000 population, and also clinical staff resourcing availability. The data also revealed that the SPA teams were not meeting their internal target for the 24 hour turnaround of referrals processing which has implications on downstream treatment teams.

Despite the differences between the SPAs, the VSM devised for each team revealed five fundamental process steps common to each operating model:

1. Triage: Referral urgency and patient age
2. Quality review of referral information
3. Information gathering
4. Clinical decision making and allocation
5. Discharge and transfer to treatment team

It also identified operational inconsistencies in terms of the use of staff, record keeping and clinical decision making responsibilities.

Operational Measurement	Type of data	SPA 1	SPA 2	SPA 3	SPA 4
Demand	Referrals per 1,000 population	12	29	19	N/A
	Main sources of referrals	GPs 64% Other health professional 15 % IAPT Team 8%	GPs 74% Other health professional 6% A&E 5%	GPs 76% IAPT Team 15% Other health professional 3%	
	Referrals admitted into Trust services	63%	71%	-	
Capacity	SPA Team staff composition: Clinical	1 + support from multidisciplinary team (external to SPA)	6 (day shift), 3(night shift)	2 + support from 2 clinicians external to SPA	N/A
	Administrative	2	3	2	
Responsiveness	Referrals processed by SPA within 24 hrs	53%	65%	57%	N/A
Output effectiveness	Main recipients of SPA referrals	CMHT, 'Other', Psychology	IAPTs, CMHT, Memory Services	Crisis, CMHT, Psychology	N/A
	Referrals considered inappropriate by treatment teams	-	-	-	
Financial	Operational cost of the SPA	-	-	-	N/A
	Cost of processing one referral				
	Cost of processing one referral by the default team				

Table 3: Initial Quantitative performance data used within this study

NB: BDU 4 does not offer a true single point of access service so 'SPA 4' has been excluded from the initial baseline comparison. However, equivalent performance data for SPA 4 has been obtained which was used to forecast service demand and capacity planning during Redesign.

Conclusion / Future development of paper

The use of Lean tools and techniques within the study has thus far exposed the extent of variations across the four SPAs and revealed where wasteful processes and behaviours are occurring. These findings have identified where the further application of Lean thinking could improve operational processes, which could lead to better service quality, clinical safety and contribute to improving system wide process efficiencies.

At the time of writing, this study was at the final stages of baseline data collection and not yet entered Redesign. As such, no comparative Redesign model(s) were available from which quantitative evidence can be derived to fully support and answer RQ1. However, from the work done so far it can be concluded that Lean has provided information which has allowed strategic decision makers to recognise the strengths and weaknesses within their existing systems, and focus and prioritise future SPA Redesign efforts. In respect to RQ2, it is expected that this can be addressed once a Redesign model is realised.

By the time of the BAM Conference, it is expected that a number of redesigned, leaned, operating models would be near completion. These redesigned models could potentially be presented to the group and delegates invited to challenge the robustness of the new models. Discussions could also centre around the effectiveness of the Lean tools used to elicit data, and problems/barriers encountered when applying Lean to this type of service environment.

References

AL-HAKIM, L. & GONG, X. Y. 2012. On the day of surgery: how long does preventable disruption prolong the patient journey? . *International Journal of Health Care Quality Assurance,* 25**,** 322 - 342.

BAMFORD, D. & CHATZIASLAN, E. 2009. Healthcare capacity measurement. *International Journal of Productivity and Performance Management,* 58**,** 748-766.

BAMFORD, D., THORNTON, H. & BAMFORD, J. 2009. Health-care logistics redesign. *Operational Reasearch Society* 22**,** 140–152.

BIRMINGHAM COMMUNITY HEALTHCARE. 2013. *Single point of access for adult services in Birmingham* [Online]. Available: http://www.bhamcommunity.nhs.uk/about-us/services-and-corporate-departments/adults-and-communities/citywide-services/adult-spa/ [Accessed February 2013].

CASTLE, A. & HARVEY, R. 2009. Lean information management: the use of observational data in health care. *International Journal of Productivity and Performance Management,* 58**,** 280 - 299.

DEHE, B., BAMFORD, D. & BAMFORD, J. 2011. An Application of a MCDA Model for Healthcare Site Selection. In: 22nd Annual Production and Operations Management Society (POMS) Conference 2011, April 29th-May 2nd 2011, Reno, Nevada, USA.

DEPARTMENT OF HEALTH, 2010. *Equity and excellence: Liberating the NHS,* Norwich, TSO .

DICKSON, E. W., ANGUELOV, Z., VETTERICK, D., ELLER, A. & SINGH, S. 2009. Use of Lean in the Emergency Department: A Case Series of 4 Hospitals. *Annals of Emergency Medicine,* 54**,** 504 - 510.

ESAIN, A. E., WILLIAMS, S. J., GAKHAL, S., CALEY, L. & COOK, M. W. 2012. Healthcare quality improvement - policy implications and practicalities. *International Journal of Health Care Quality Assurance,* 25**,** 565 - 581.

FERRARI, L. R., MICHELI, A., WHITELEY, C., CHAZARO, R. & ZURAKOWSKI, D. 2012. Criteria for assessing operating room utilization in a free-standing children's hospital. *Pediatric Anesthesia,* 22**,** 696–706.

FLOWERS, M., PARKINSON, L., & BARNETT, K. 2012. *Mental Health Acute Pathway: A review of provision,* Internal Executive Management Team Report.

GALLIMORE, A., HAY, L. & MACKIE, P. 2009. What can service providers do to improve access to services for people with multiple and complex needs? . Edinburgh: PATH.

GRABAN, M. & SWARTZ, J. E. 2012. Change for health. *Management Services***,** 35-39.

HARMONI. 2013. *Single point of access services* [Online]. Available: http://www.harmoni.co.uk/single-point-of-access-services [Accessed February 2013].

HERRING, L. 2009. Lean experience in primary care. *Quality in Primary Care ;17:,* 17**,** 271–275.

JANKOWICZ, A. 2005. *Business Research Projects,* London, Thomson.

JONES, P., CHALMERS, L., WELLS, S., AMERATUNGA, S., CARSWELL, P., ASHTON, T., CURTIS, E., REID, P., STEWART, J., HARPER, A. & TENBENSEL, T. 2012. Implementing performance improvement in New Zealand emergency departments: the six hour time target policy national research project protocol. *BMC Health Services Research* 12**,** 1-10.

JOOSTEN, T., BONGERS, I. & JANSSEN, R. 2009. Application of lean thinking to health care: issues and observations. *International Journal for Quality in Healthcare,* 21**,** 341-347.

LAGANGA, L. R. 2011. Lean service operations: Reflections and new directions for capacity expansion in outpatient clinics. *Journal of Operations Management* 29**,** 422–433.

MANDAHAWI, N., AL-ARAIDAH, O., BORAN, A. & KHASAWNEH, M. 2011. Application of Lean Six Sigma tools to minimise length of stay for ophthalmology day case surgery. *International Journal of Six Sigma and Competitive Advantage,* 6**,** 156-172.

MEREDITH, J. O., GROVE, A. L., WALLEY, P., YOUNG, F. & MACINTYRE, M. B. 2011. Are we operating effectively? A lean analysis of operating theatre changeovers. *Journal of Operations Management Research,* 4**,** 89–98.

MORROW, E., ROBERT, G., MABEN, J. & GRIFFITHS, P. 2012. Implementing large-scale quality by improvement: Lessons from the productive ward: Releasing tme to care! . *International Journal of Health Care Quality Assurance,* 25**,** 237 - 253.

NHS HUMBER. 2013. *Single Point of Access* [Online]. Available: http://www.humber.nhs.uk/services/single-point-of-access.htm [Accessed February 2013].

NHS INSTITUTE FOR INNOVATION AND IMPROVEMENT. 2012. *Commission for Quality and Innovation (CQUIN) payment framework - Summary of indicators* [Online]. Available: http://www.institute.nhs.uk/world_class_commissioning/pct_portal/cquin.html [Accessed February 2013].

PAPADOPOULOS, T., RADNOR, Z. & MERALI, Y. 2011. The role of actor associations in understanding the implementation of Lean thinking in healthcare. *International Journal of Operations & Production Management,* 31**,** 167-191.

RADNOR, Z. 2011. Implementing Lean in Health Care: Making the link between the approach, readiness and sustainability. *International Journal of Industrial Engineering and Management* 2**,** 1-12.

SAFAYENI, F., PURDY, L., VAN ENGELEN, R. & PAL, S. 1991. Difficulties of Just-in-Time Implementation: A Classification Scheme. *International Journal of Operations & Production Management* 11**,** 27 - 36.

SCHWARZ, P., PANNES, K. D., NATHAN, M., REIMER, H. J., KLEESPIES, A., KUHN, N., RUPP, A. & ZÜGEL, N. P. 2011. Lean processes for optimizing OR capacity utilization: prospective analysis before and after implementation of value stream mapping (VSM). *Langenbecks Archives of Surgery,* 396**,** 1047–1053.

STUART, I., MCCUTCHEON, D., HANDFIELD, R., MCLACHLIN, R. & SAMSON, D. 2002. Effective case research in operations management: A process perspective. *Journal of Operations Management,* 20**,** 419-433.

WOJTYS, E. M., SCHLEY, L., OVERGAARD, K. A. & AGBABIAN, J. 2009. Applying Lean Techniques to Improve the Patient Scheduling Process. *Journal for Healthcare Quality,* 31**,** 10–16.

ZHANG, S., BAMFORD, D., MOXHAM, C. & DEHE, B. 2012. Strategy deployment systems within the UK healthcare sector: a case study. *International Journal of Productivity and Performance Management,* 61**,** 863-888.