

FROM INFORMATION TO INTELLIGENCE - DATA INFORMED DECISION MAKING

Innovative design for quality improvement in patient flow, waiting period and work force utilisation using data informed decision making

Dr. Shalomie Shadrach, Darling Downs Hospital and Health Service, Australia.

Introduction

Innovative service evaluation designs continue to be the driving force for cost effective quality improvement in the health sector. Recently the rise of digital technology in the health care sector has enabled data informed decision making to have insights that were not previously available and serve as the critical innovative component required for improving business productivity. There is a growing challenge on the public health care sector to deliver a quality and timely patient centred care within existing resources irrespective of growing population demands. This presentation describes an innovative design used by this study to improve efficiency and to inform ways for improving patient flow, decreasing waiting time, and improving workforce utilisation in oral health delivery in a public health service setting.

Objectives

The main objective was to inform ways for a better and timelier public oral health service delivery and provide information for strategic approach that can lead to improved service delivery.

The main objective was further subdivided into the following three research objectives;

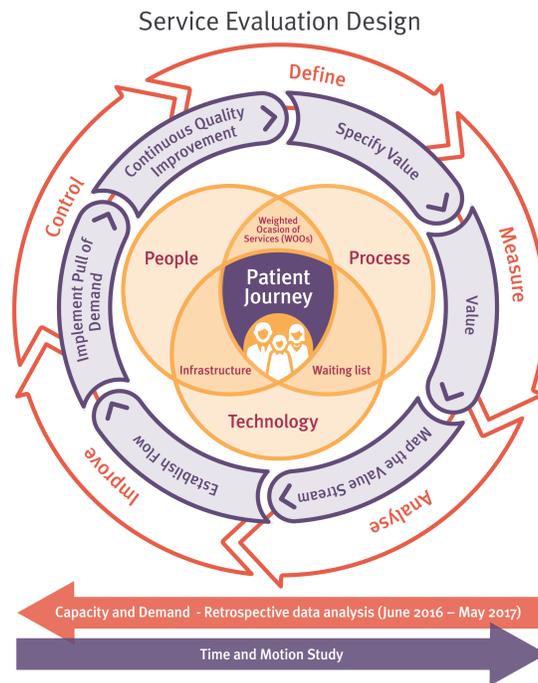
- To evaluate the factors impacting Weighted Occasion Of Service (WOOS) activity state targets and to derive proactive strategic planning of activities to achieve WOOS targets instead of reacting to short term swings.
- To identify factors that influence demand and utilisation of the services and to develop strategies to effectively manage the waiting period for general waiting list customers within the state target.
- To analyse and evaluate the capacity of the oral health service to enhance future planning and implications for the service.

Material and Methods

The service evaluation established two working groups namely Professional Working Group (PWG) and Data Working Group (DWG). PWG included staff representation from each occupational stream and by facility. DWG included key data managing positions from the central Office of Chief Dental Officer, Darling Downs Hospital and Health Services, and management. The evaluation design administered the lean six sigma methodologies with a focus on process evaluation. The process evaluation reviewed infrastructure, waiting lists and Weighted Occasion Of Service (WOOS) with context to the patient journey within the system. Mixed statistical methodologies were used on retrospective data to evaluate capacity and demand including infrastructure and provider utilisation. Additionally, a time and motion study was conducted on staff representation from every occupational stream by facility to assess the capacity of resources and to stabilise processes. The information derived were triangulated through established working groups to validate and generate quality dimensions to develop a strategic localised model of care for every facility.

References

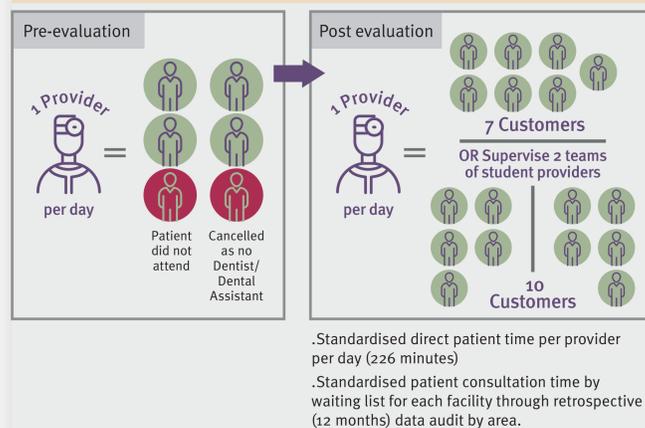
Mark Graban. Lean Hospitals - Improving Quality, Patient Safety, and Employee Engagement. Third Edition 2016 (ISBN 978 1 4987 4325 9)
 WHO evaluation practice handbook. World Health Organization 2013. NLM classification: WA 39 (ISBN 978 92 4 154868 7)
 Danida Evaluation guidelines. Evaluation Department, Ministry of Foreign Affairs of Denmark. January 2012 (ISBN: 987-87-7087-598-1, e-ISBN: 987-87-7087-599-8)
 Taylor MJ, McNicholas C, Nicolay C, et al. Systematic review of the application of the plan-do-study-act method to improve quality in healthcare. *BMJ Qual Saf* 2014;23:290-298 (doi:10.1136/bmjqs-2013-001862)
 Kaveh G. Shojania and Jeremy M. Grimshaw. Evidence-Based Quality Improvement: The State Of The Science. *Health Affairs* 24, no.1 (2005):138-150 (doi:10.1377/hlthaff.24.1.138)
 Patton, Michael Winston Jr., "DEVELOPING A TIME AND MOTION STUDY FOR A LEAN HEALTHCARE ENVIRONMENT" (2011). University of Kentucky Master's Theses. Paper 163.
 DiGioia AM., et al., "Determining the True Cost to Deliver Total Hip and Knee Arthroplasty Over the Full Cycle of Care: Preparing for Bundling and Reference-Based Pricing," *The Journal of Arthroplasty*, 31 no.1, 2016; The PFCC Innovation Centre of UPMC; Physician Executive Council interviews and analysis. Accessed through "Joint Replacement Pathway Toolkit" Care Experience Flow Map Example and Template by The Advisory Board Company 2016
 James D Hess, Bruce A. Benjamin, (2015) "Applying Lean Six Sigma within the university: opportunities for process improvement and cultural change", *International Journal of Lean Six Sigma*, Vol. 6 Issue: 3, pp.249-262, https://doi.org/10.1108/IJLSS-12-2014-0036
 Laureani Alessandro, Brady Malcolm, Antony Jiju, (2013) "Applications of Lean Six Sigma in an Irish hospital", *Leadership in Health Services*, Vol. 26 Issue: 4, pp322-337, https://doi.org/10.1108/LHS-01-2012-0002



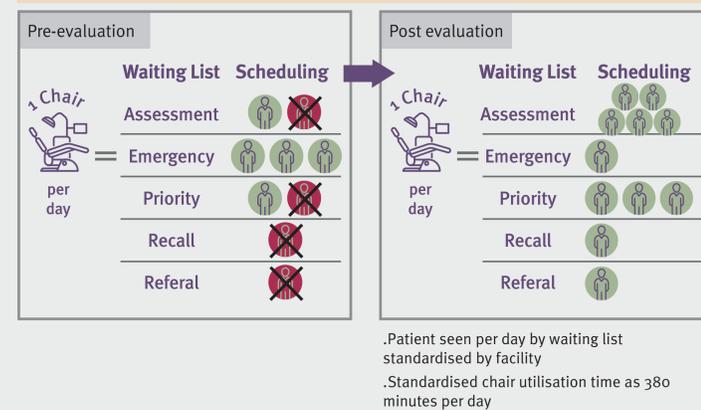
Results

- WOOS planning on service delivery was made possible through the findings on the average amount of WOOS generated by each waiting list. General Anaesthesia waiting list patients generated an average of 18 WOOS for treatment, followed by the Priority list (5.33 WOOS), General Assessment (4.01 WOOS), Referral (3.7 WOOS), Recall (3.4 WOOS) and Emergency (3.4 WOOS). One WOOS is equivalent to the workload of a comprehensive oral examination.
- It was identified that emergency patients took the most part of providers time yet generated lesser WOOS compared to waiting list patients.
- **Service Utilisation:** The evaluation concluded that the overall chair utilisation rates were on average 34% and provider utilisation rates were on average 71%.
- **Demand on Service:** Darling Downs had a demand of 36% from the eligible population with an average 5% placed on waiting lists for the evaluation period.

Provider Utilisation



Infrastructure Utilisation



- The evaluation design came up with localised patient service targets for adult dental care providers; such as a minimum of seven patients per day that consists of three patients from the general waiting list. It was noted that a team of two student providers can service about five patients per day. A provider supervising two teams of student providers can help get 10 patients off the waiting list compared to a provider capacity of seven patients per day by themselves.
- The methodology came up with local patient scheduling targets for staff; such as a minimum of 11 patients per chair per day that consists of five patients from the general assessment list, one each from the emergency, recall and referral waiting lists, and three from the priority waiting list. This number was different for each facility as it depended on the standardised patient consultation time by waiting list for each facility.

Conclusion

Continuous quality improvement on measurable targets improves service delivery. This study highlighted elements that are considered as innovative design to plan the WOOS by facility instead of reacting to short term swings in oral health service. The evaluation helped schedule patients more effectively, managing limited resources and workforce numbers by standardising the process and identifying capability through a demand driven approach. The service evaluation design identified methodologies to effectively manage patient flow from various waiting lists (including general, general anaesthetic, priority, recall and referral) while paying closer attention to demand.

Recommendations

- Key recommendations included:
- Producing data integrity targets;
 - Maintaining provider to dental assistant daily ratios;
 - Effective rescheduling of cancellations;
 - Standardising emergency patients seen per by a provider per day;
 - increase outsourcing of emergency patients; and
 - strategically benefiting from student dental providers.

Co-Authors

Mr Phillip Gray, Senior Research Officer, Office of the Chief Dental Officer - Clinical Excellence Division, Department of Health
 Mr Christopher Hombsch, Service Manager Darling Downs Hospital and Health Service Oral Health, Darling Downs Hospital and Health Services
 Ms Melanie Harrison, Coordinator Oral Health Administration, Toowoomba Oral Health Clinic, Darling Downs Hospital and Health Services

Acknowledgements

Data Working Group: Dr Ben Stute, Karen Barry, & Debra McKenzie
 Professional working Group: Karen Barry, Sheena Schnitzerling, Debra McKenzie, Natalie Brown, Dr. David Griffiths, Dr. James Gambrell, Dr. Cornelius J Richter, Dr. Jason Xu, Graham Gow, Neville Flohr, Fawad Hussain, Moira Ruhle, Kellie Amos, Melita Ewing, Amanda Smith & Stacey Hughes
 Time and Motion study oral health staff participants
 Eligible population to access DDHHS Oral Health Service calculation - Bridget Appleyard
 Management: Shirley-Anne Gardiner & Jodie Pritchard
 Poster Design: Trudy Morrisson

For further information

Shalomie Shadrach - shalomie.shadrach@health.qld.gov.au
 Phone: +61 7 4699 8258