



CASE STUDY

Reducing cost and improving quality of care for high-risk babies in Karnataka, India

Summary

In November 2016, the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project collaborated with Lady Hardinge Medical College, National Neonatology Forum (NNF) Karnataka Branch, and Ovum Hospital to support 27 public, private, and academic medical facilities from Karnataka, Kerala, and Tamil Nadu to conduct a workshop to support the development of quality improvement (QI) projects related to neonatal health. One of the participating facilities faced an issue in its neonatal intensive care unit (NICU). All high-risk babies admitted to this NICU undergo at least one brain scan and heart scan if there are medical indications. While the NICU was staffed with neonatologists who were trained in conducting such scans, the scans were always done by external consultants. Although there were benefits to having specialists perform these tests, certain limitations existed. First, external consultants were not always available when scans were needed urgently to make medical decisions. Second, external consultants added to the cost of care for patients' families. Therefore, the QI team at this NICU set an aim to reduce the use of external radiologists and cardiologists for routine brain and heart scans; thus, reducing the cost of performing scans and improving the quality of care by making test results more rapidly available to inform timely medical decisions.

Background

In November 2016, the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project collaborated with Lady Hardinge Medical College, National Neonatology Forum (NNF) Karnataka Branch, and Ovum Hospital to support 27 public, private, and academic medical facilities from Karnataka, Kerala, and Tamil Nadu to develop QI projects related to neonatal health. As part of this effort, ASSIST staff conducted a two-day workshop in Bangalore on the Point of Care Quality Improvement (POCQI) methodology.¹ The four steps of POCQI were discussed in detail during these two days: 1) identify a problem, form a team and write an aim statement; 2) analyze the problem and measure the quality of care; 3) develop and test changes; and 4) sustain the improvements. The groups of participants from different facilities were taught how to use QI methods and plan their first quality improvement project.

One of the facilities that participated in this workshop has a newborn intensive care unit (NICU) caring for sick newborns born primarily in Karnataka and neighboring states as well as high-risk babies referred from the Middle East region, Mauritius and even countries in Africa like Nigeria. All high-risk babies admitted to the NICU undergo at least one brain scan and heart scan (echocardiogram) if

STEPS IN QUALITY IMPROVEMENT

STEP 1: IDENTIFY A PROBLEM, FORM A TEAM AND WRITE AN AIM STATEMENT

STEP 2: ANALYZE AND MEASURE QUALITY OF CARE

STEP 3: DEVELOP AND TEST CHANGES

STEP 4: SUSTAIN IMPROVEMENTS

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This case study was authored by Venkatesh HA and Ravi Swami of Manipal Hospitals and Mahtab Singh and Nigel Livesley of University Research Co., LLC (URC) for the United States Agency for International Development (USAID) Applying Science to Strengthen and Improve Systems (ASSIST) Project, made possible by the generous support of the American people through USAID's Bureau for Global Health, Office of Health Systems. The USAID ASSIST Project is managed by URC under the terms of Cooperative Agreement Number AID-OAA-A-12-00101. URC's global partners for USAID ASSIST include: EnCompass LLC; FHI 360; Harvard T. H. Chan School of Public Health; HEALTHQUAL International; Initiatives Inc.; Institute for Healthcare Improvement; Johns Hopkins Center for Communication Programs; and WI-HER, LLC. For more information on the work of the USAID ASSIST Project, please visit www.usaidassist.org or write assist-info@urc-chs.com.

there are medical indications. The brain scan is done to identify brain damage due to bleeding or inadequate blood supply; the heart scan (echocardiogram) is done to identify problems with the heart and blood vessels. While the NICU was staffed with in-house neonatologists who were capable of doing the brain and heart scans, these scans were always done by external consultants – radiologists and cardiologists, respectively. Although there were benefits to having these specialists perform these tests, certain limitations existed. First, there were occasions when scans were needed urgently to make medical decisions and external consultants were not available. Second, using external consultants added substantially to the financial cost of care for patients' families.

Members of the NICU team wanted to improve the timeliness and availability of brain and heart scan reports to speed up medical decisions and also to reduce the costs of conducting these scans. Therefore, the QI team at this NICU set an aim to reduce the use of external radiologists and cardiologists for routine brain and heart scans; hence, reducing the cost of performing scans and improving the quality of care by making test results more rapidly available to inform timely medical decisions. Instead of using external consultants for routine scans of high-risk babies, the neonatologists in the NICU would perform the required brain and heart scan on admission. External consultants would continue to be called for detailed assessment and confirmation if the neonatologist identified a problem, such as a congenital malformation of the brain or heart.

Problem analysis

To address their aim the team leader, a neonatologist in the NICU, formed a quality improvement team that included another neonatologist in the unit, a staff nurse, and a patient care coordinator. The team used the 5 Whys approach to understand why so many external consultants were being used even though the neonatologists were trained and capable of performing brain and heart scans themselves. The 5 Whys is an interrogative approach to analyze the underlying cause of a problem through asking a series of progressive “why” questions. While the approach typically involves asking five “why” questions, sometimes analyzing a problem requires asking “why” more than five times, or fewer than five times.

Q. Why do external consultants always come to do tests?

A. External consultant are called when a medical decision has been made to obtain a scan.

Q. Why is the call always given to external consultants?

A. The person responsible for placing the call always does that.

Q. Why does he place a call to external consultants only?

A. As per the existing process in the department.

The team realized that external consultants were being called after a medical decision was made to order a brain or heart scan simply because existing policies stipulated that a specialist should be called.

Implementation of the QI work

The team decided to test a change to the existing policy such that external consultants were only contacted if neonatologists requested the consultation. As a quick assessment, the QI team initially compared the results of scans for two babies done by the neonatologists to scans done by the radiologists and cardiologists; results were similar. The test was then scaled up to all babies admitted under these two neonatologists; results were still comparable. The team shared the results with all in the department, and a new protocol was written to call the external consultants only in cases when the neonatologists requested the consultation. This ensured that families were not burdened by the consultation fee charged by radiologists and cardiologists when it was not necessary.

Quality Improvement Team Members

Team leader:

- Dr Venkatesh H A, neonatologist, NICU

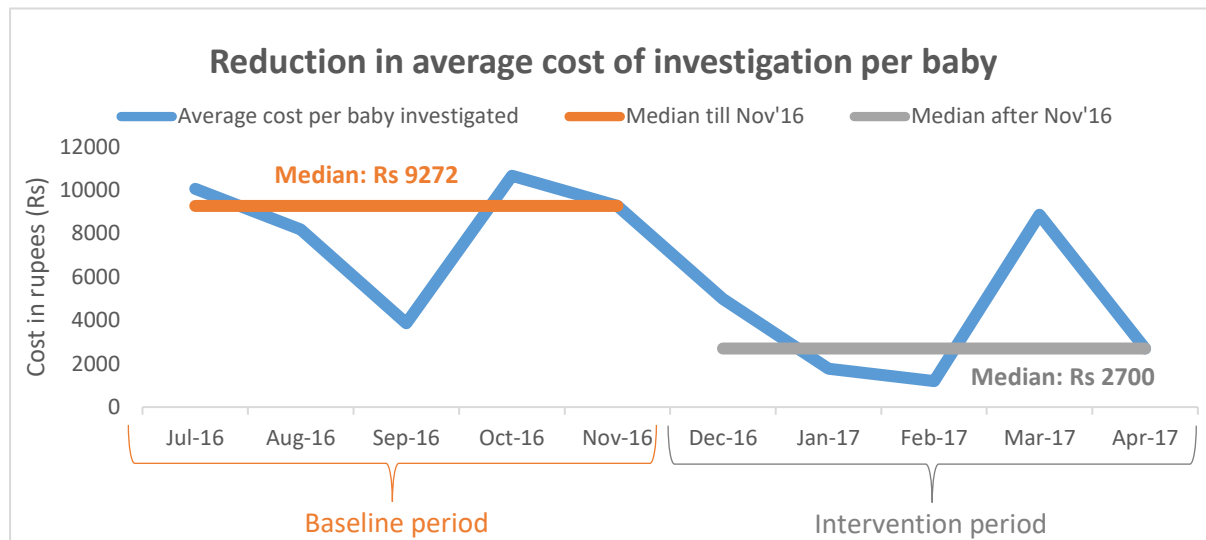
Other team members:

- Dr Ravi Swamy, neonatologist, NICU
- Beulah Unis, staff nurse, NICU
- Pushpavalli Gopalakrishna, patient care coordinator

Results

The total cost of a brain scan and echocardiogram for babies admitted under the above two neonatologists was taken at the time of discharge of the baby. The amount was calculated from the payment accounts. For both the baseline period and intervention period, data was collected by the patient care coordinator, and the median average expense per baby calculated. The results are shown in **Figure 1**.

Figure 1. Reduction in average cost per baby to conduct brain and heart scan upon admission to NICU (Jul 2016 – Apr 2017)



A reduction in cost per baby of ₹6572 rupees (USD\$102.10) was observed during the intervention period compared with the baseline period. An average worker in India makes 448 rupees per day; therefore, this amount is the equivalent of 14.6 days of labor for the average worker.

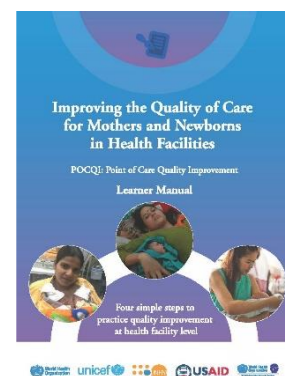
In addition, this change reduced turnaround time for getting the results from these investigations, providing NICU staff with timely test results for critical medical decisions. For example, the new protocol allowed staff to quickly identify and initiate treatment for a baby with a vascular malformation in the brain; other instances included drainage of pericardial effusion for a patient that occurred around 3 am (when an external consultant would not be available) and proper management of a hemodynamically significant patent ductus arteriosus during medical treatment.

Learning and way forward

This is a unique example how a neonatal unit used quality improvement methods to reduce the cost of care to the patients while improving the timeliness and quality of care. This effort not only helped the patients, but also improved the efficiency of the unit's operations.

References

- Deorari A, Mehta R, and Livesley N. Point of Care Quality Improvement: Improving the Quality of Care for Mothers and Newborns in Health Facilities. New Delhi, India: World Health Organization, Regional Office for South-East Asia, 2017. <https://www.usaidassist.org/resources/POCQI-manuals>



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