

Impact Assessment Study

Project Name: U. N. Mehta Institute of Cardiology & Research Centre (UNMICRC) - Technical and highly sophisticated cardiac medical equipment's for upgradation of treatment facility, research training activity of tertiary care cardiac super specialty teaching institute & for heart and lung transplant program.

Project Financial Year 2020–2021



Prepared for
Gujarat State Petronet Limited
(GSPL),
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ACRONYMS

List of Acronyms and Abbreviations

Acronym	Full Form
AVR	Aortic Valve Replacement
BJMC	B. J. Medical College
CABG	Coronary Artery Bypass Grafting
CPR	Cardiopulmonary Resuscitation
CRRT	Continuous Renal Replacement Therapy
CSR	Corporate Social Responsibility
CVTS	Cardiovascular and Thoracic Surgery
DHM	Donor Human Milk
ECMO	Extra-Corporeal Membrane Oxygenation
EMCS	Emergency Medical Cardiac Services
EVH	Endoscopic Vein Harvesting
FY	Financial Year
GITCO	Gujarat Industrial and Technical Consultancy Organisation Limited
GSPC	Gujarat State Petroleum Corporation
GSPL	Gujarat State Petronet Limited
HMIS	Hospital Management Information System
HTEE	Hemodynamic Transoesophageal Echocardiography
ICU	Intensive Care Unit
IPD	In-Patient Department
MA	Mukhyamantri Amrutam Scheme
MCA	Ministry of Corporate Affairs
MICS	Minimally Invasive Cardiac Surgery
MOM	Mother's Own Milk
OPD	Out-Patient Department
OT	Operation Theatre
PMJAY	Pradhan Mantri Jan Arogya Yojana
RBSK	Rashtriya Bal Swasthya Karyakram
SDGs	Sustainable Development Goals
TAVI	Transcatheter Aortic Valve Implantation
UNMICRC	U. N. Mehta Institute of Cardiology & Research Centre
VAD	Ventricular Assist Device
Web-HMIS	Web-based Hospital Management Information System



EXECUTIVE SUMMARY

The **U. N. Mehta Institute of Cardiology & Research Centre (UNMICRC), Ahmedabad**, is a tertiary super-specialty cardiac-care, academic, and research institution serving patients from across Gujarat and neighbouring regions. In FY 2020–21, Gujarat State Petronet Limited (GSPL), under its Corporate Social Responsibility (CSR) commitment to strengthening public healthcare infrastructure, supported the Institute by providing a set of critical-care, surgical, interventional, and institutional support equipment. This support aimed to enhance the Institute's clinical preparedness, case-handling capacity, and continuity of specialised care.

This impact assessment was carried out by **Gujarat Industrial and Technical Consultancy Organisation Ltd. (GITCO)** as an independent evaluation partner. GITCO undertook a field-based qualitative assessment, engaging senior cardiologists, cardiac surgeons, paediatric cardiac specialists, perfusion technologists, ICU and OT nursing and technical staff, respiratory and anaesthesia support teams, procurement and administrative personnel, and patients and caregivers. The study examined equipment utilisation patterns, clinical relevance, and perceived contribution to care pathways, focusing particularly on high-risk, complex, and post-operative cardiac patients.

The equipment supported during the period included systems used in critical care stabilisation (ECMO, CRRT, motorised ICU beds, ventilatory and infusion support), surgical and interventional systems (TAVI valves, VAD console, sutureless/pericardial valves, EVH and MICS instrument sets, HTEE probe, and C-Arm compatible OT table), and institutional care infrastructure (Homograft Valve Bank systems, Mother Milk Bank equipment, and Web-HMIS). Across respondent groups, these systems were described as enabling improved clinical decision-making flexibility, safer intervention in complex cardiac cases, and smoother continuity of recovery, especially for patients requiring extended ICU care or specialised paediatric follow-up.

Staff reflections highlighted that the value of these systems is embedded in clinical readiness and treatment continuity, rather than only procedural efficiency. The equipment enables teams to stabilise fragile patients, reduce handling risks, support real-time assessment during surgery, and maintain recovery conditions conducive to patient comfort and safety. Institutional systems such as the Homograft Valve Bank and Mother Milk Bank were understood as strengthening specialised, neonatal and paediatric cardiac care pathways. The Web-HMIS platform was described as supporting record continuity across units.

Overall, the assessment finds that GSPL's CSR support has contributed to strengthening UNMICRC's capacity to manage high-acuity cardiac cases, expanding treatment suitability, and supporting care continuity across critical, surgical, and post-operative stages. The equipment



has been fully integrated into routine clinical practice and continues to hold sustained functional relevance.



1. ABOUT THE CSR FUNDING AGENCY AND THE ASSESSMENT PARTNER

1.1. Gujarat State Petronet Limited (GSPL)

Gujarat State Petronet Limited (GSPL), a Government of Gujarat enterprise and subsidiary of Gujarat State Petroleum Corporation (GSPC), is one of India's leading natural gas transmission companies. Beyond its business operations, GSPL has maintained a consistent commitment to Corporate Social Responsibility (CSR) as a means to foster inclusive growth and social well-being across Gujarat.

In accordance with Schedule VII of the Companies Act, 2013, GSPL's CSR initiatives focus on key thematic areas including Healthcare & Sanitation, Education, Environment and Sustainability, Livelihood Promotion, and Rural Development. Within this framework, the company places particular emphasis on strengthening public health infrastructure and improving access to quality medical services for vulnerable and underserved populations.

During FY 2020–21, under its CSR focus area of Healthcare & Sanitation, GSPL funded the procurement of advanced cardiac and institutional medical equipment for the U. N. Mehta Institute of Cardiology & Research Centre (UNMICRC) in Ahmedabad. The support aimed to enhance and strengthen the institute's tertiary-care capacity, improve quality of cardiac treatment, and strengthen institutional systems that deliver high-impact medical services to the community.

This partnership demonstrates GSPL's commitment to long-term community impact through strategic CSR investment, contributing directly to Sustainable Development Goal 3 (Good Health and Well-being) and reinforcing the Gujarat State Health Mission's objective of expanding quality tertiary healthcare.¹

1.2. Gujarat Industrial and Technical Consultancy Organisation Ltd. (GITCO)

Gujarat Industrial and Technical Consultancy Organisation Ltd. (GITCO) is a multi-disciplinary consultancy organisation established in 1978 to support industrial, infrastructure, and socio-economic development in Gujarat. Promoted by leading state-level financial institutions, GITCO undertakes technical advisory, feasibility assessment, programme evaluation, policy support, and CSR impact assessment assignments across sectors including healthcare, education, livelihoods, public infrastructure, and institution-building.



¹ Gujarat State Petronet Limited – CSR Policy and Annual Reports (2020–21), <https://www.gsplindia.com>

In the context of CSR evaluation, GITCO conducts independent assessments to examine utilisation, relevance, effectiveness, and outcome pathways of CSR-funded interventions. The approach emphasises field-based inquiry, stakeholder engagement across clinical and operational levels, and evidence-grounded interpretation aligned with national CSR guidelines and evaluation standards.

For this assignment, GITCO served as the independent assessment agency, responsible for designing the evaluation framework, conducting field interviews and observations, analysing usage and outcome patterns of the supported equipment, and preparing this report for submission to GSPL.

1.3. Study Context

This impact assessment evaluates the effectiveness and outcomes of GSPL's CSR-funded intervention at UNMICRC during FY 2020–21. The study has been undertaken in compliance with the Ministry of Corporate Affairs (MCA) CSR Amendment Rules 2021, which call for third-party impact assessments of major CSR projects.

The methodology involved field-level data collection, document verification, and stakeholder interviews to assess the installation, operational utilisation, and performance of the GSPL-funded equipment, and to determine their impact on clinical service delivery, institutional strengthening, and public benefit.



2. INSTITUTIONAL PROFILE: U. N. MEHTA INSTITUTE OF CARDIOLOGY & RESEARCH CENTRE (UNMICRC)

2.1 Institutional Background

The U. N. Mehta Institute of Cardiology & Research Centre (UNMICRC), situated within the Civil Hospital Campus, Asarwa, Ahmedabad, Gujarat, is one of India's largest and most advanced super-specialty centres dedicated to emergency-related tertiary cardiac care, teaching, and research. Established in 1992 as an autonomous, grant-in-aid institution under the Government of Gujarat, UNMICRC operates in affiliation with B. J. Medical College (BJMC) and serves as a regional, national, and international hub for cardiac sciences.

Initially functioning as the Cardiology Department at the Civil Hospital (since 1982), the Institute has evolved into a comprehensive tertiary-care facility integrating clinical services, education, and biomedical research. It provides high-quality, affordable cardiac care to patients (both adults and children) from Gujarat and across India, particularly from economically weaker sections, and trains super-specialists in Cardiology and Cardiothoracic Surgery.

2.2 Institutional Capacity and Reach

UNMICRC is regarded as the largest single super-specialty cardiac teaching hospital in India and among the leading dedicated cardiac-care institutions globally. The Institute is equipped with state-of-the-art infrastructure and highly sophisticated medical technologies, enabling delivery of advanced cardiac treatment, research, and academic training within a single, integrated ecosystem.

As of 2025, it operates approximately 1,251 beds, including 513 critical-care beds, positioning it among the largest cardiac hospitals in Asia.² Its facilities include:

- Advanced adult and paediatric cardiac surgery units;
- Catheterisation laboratories and electrophysiology suites;
- Fully equipped Cardiac ICU units (including Paediatrics & Neonatal ICU units);
- Technically robust support for heart- and lung-transplant readiness; and
- A research and simulation centre.

The institute maintains round-the-clock emergency care, and a multidisciplinary team of cardiologists, surgeons, anaesthetists, perfusionists, nurses, and technicians.



² U. N. Mehta Institute of Cardiology & Research Centre – Official Website, accessed November 2025. <https://www.unmicrc.org/About/Default>

Overview of Patient Load & Outreach (as per the Institute's published data of the year 2024):

- OPD patients: 363,315
- IPD patients: 50,077
- Total cardiac procedures: 28,691
- Total cardiac surgeries: 8,120

These numbers reflect the significant scale at which the institute operates - serving a large volume of patients, both in routine and complex interventions, demanding continuous upgradation and readiness for medical emergencies.

2.3 Role in Gujarat's (and nation's) Public Health System

UNMICRC serves as the apex tertiary referral centre for cardiac emergencies and advanced cardiac treatment in Gujarat and across India. It plays a crucial role in expanding equitable access to high-quality, life-saving cardiac care, particularly for economically weaker patients, through a combination of benevolent initiatives and government-supported schemes.

The Institute operates the Emergency Medical Cardiac Services (EMCS) scheme, providing immediate treatment for critical cardiac emergencies without advance payment during the initial 24 hours of admission. It is also empanelled under key government health assurance programmes such as *Mukhyamantri Amrutam* (MA), *Ayushman Bharat - PMJAY*, and *Rashtriya Bal Swasthya Karyakram* (RBSK), along with several state and central relief funds.

By integrating these mechanisms within its service delivery model, UNMICRC ensures timely access to advanced cardiac care for all patients, irrespective of their economic background, thereby reinforcing its role as a critical institution in Gujarat's (*and nation's*) public healthcare framework.³

2.4 Linkages with SDGs

UNMICRC's functioning and CSR-supported upgradation are closely aligned with national and global frameworks:

- **SDG 3 - Good Health & Well-Being:** Ensuring and improving access to advanced cardiac care, reducing morbidity and premature mortality from cardiovascular diseases, and expanding capacity.

³ U. N. Mehta Institute of Cardiology & Research Centre – Official Website, *About / Patient Benevolent Emergency, Free and Concessional Cardiac Treatment Schemes*, accessed November 2025. <https://www.unmicrc.org/About/Default>



- **SDG 9 - Industry, Innovation & Infrastructure:** Adoption of advanced technologies for advanced medical procedures and institutional innovation in healthcare delivery.
- **SDG 17 - Partnerships for the Goals:** Synergistic partnership between the Government of Gujarat, academia (BJMC), corporate partners (GSPL), and UNMICRC for sustainable healthcare delivery.



3 PROJECT OVERVIEW

3.1 Background of CSR Support

During the financial year 2020–21, Gujarat State Petronet Limited (GSPL) extended CSR funding support to UNMICRC under its healthcare thematic priority. The support aimed to strengthen the Institute’s tertiary-care capacity and broaden access to underserved patients, through procurement and installation of advanced life-saving, critical-care, diagnostic, surgical, and institutional infrastructure equipment. The initiative aimed to augment clinical and operational capacity, improve the quality of cardiac care, strengthen advanced care delivery, peri-operative support, emergency stabilisation, neonatal recovery, and support the institute’s expanding service load as a state and national referral centre.

This assistance was structured under the *Companies Act, 2013 - Section 135* CSR provisions, and aligned with the institute’s strategic needs and the state’s cardiac care priorities. The focus was on high-value capital assets that would directly contribute to *service delivery quality, clinical throughput, and institutional resilience* in cardiac and critical-care domains.

3.2 Nature and Extent of Support

Under GSPL’s CSR contribution for FY 2020–21, 28 equipment items were supported, spanning domains of cardiac treatment, life support, surgical care, and institutional systems.

Financial Overview:

Particulars	Amount (₹)
Total Equipment Cost (28 equipment items)	8,10,79,840
CSR Contribution – GSPL	7,57,93,193
UNMICRC’s Contribution	52,86,647

The difference amount was borne by the Institute from its internal budget to ensure full realisation of the project scope.⁴

⁴ UNMICRC – Official CSR Record (FY 2020–21 Equipment Procurement List, GSPL Support), verified from institutional documentation, 2025.



3.3 Equipment Supported under CSR (FY 2020–21)

Below is the full list of equipment supported in FY 2020-21 by GSPL at UNMICRC:

Sr. No	Particulars	Details of Equipment	Invoice Amount (₹)
1	CRRT	Continuous Renal Replacement Therapy Machine	25,98,000
2	Automatic Non-invasive Venti BIPAP	Portable BIPAP Machine	25,91,613
3	Transcatheter Aortic Heart Valve	Transcatheter Aortic Valve Implantation (TAVI) Valve	20,14,645
4	Console for Ventricular Assist Device	Console for Ventricular Assist Device for Adults and Neonates	51,50,000
5	Cardiac Output Monitor	Continuous Cardiac Output Monitoring System	40,00,000
6	High-end Motorised ICU Bed	High End Motorised ICU Bed with Integrated Air Mattress for Heart and Lung Transplant Patients	16,80,000
7	High-end Motorised ICU Bed	High End Motorised ICU Bed for Early Mobilization and ICU Rehabilitation	24,50,000
8	Automatic Non-Invasive Venti BIPAP	Portable BIPAP Machine	8,63,871
9–15	Mother Milk Bank	Equipment Sets for Mother Milk Bank (7 items)	29,44,520
16	Pharmacy Purchase – EVOLUT R Core Valve System 34 size	TAVI Valve	20,14,645
17	ICU Bed Motorised with Mattress, Air Bed	High End Motorised ICU Bed with Integrated Air Mattress	16,80,000
18	ECMO Machine	Mobile Extra Corporeal Membrane Oxygenation System	70,00,000
19	Web HMIS	Hospital Management Information System	75,00,000
20	C-Arm Compatible OT Table	Operation Theatre Table (Fluoroscopy Compatible)	70,00,000
21	Homograft Valve Bank	Equipment for Valve Preservation and Storage	1,55,00,000
22	EVOLUTE R Core Valve System	Transcatheter Aortic Valve Implantation (TAVI) Valve	1,47,31,836



Sr. No	Particulars	Details of Equipment	Invoice Amount (₹)
23	Sutureless Aortic Valve	Implantable Valve Device	2,58,279
24	Perimount Mitral Magna Ease Valve	Implantable Valve Device	2,04,089
25	EVH System	Endoscopic Vein Harvesting Cannula	7,11,245
26	HTEE Probe	High-frequency Transoesophageal Echocardiography Probe	1,28,800
27	RF Optitorque – Tiger Catheter	Diagnostic Catheter	997
28	Rotalink and Rotawire	Rotational Atherectomy Device and Accessories	57,300
	Total cost of Equipment (28 Equipment)		8,10,79,840
	CSR Funding by GSPL		7,57,93,193
	Institution's Contribution		52,86,647

(Total verified from institutional record, FY 2020–21 CSR documentation.)

3.4 Functional Categorisation of Supported Equipment

Category	Representative Equipment	Intended Outcomes
Critical & Intensive Care Support	CRRT, BIPAP, VAD Console, Cardiac Output Monitor, ICU Beds, ECMO	Improved survival in end-stage heart/lung failure, transplant readiness, and advanced ICU management.
Surgical & Interventional	TAVI Valves, EVOLUTE R Systems, Sutureless Valves, EVH System, HTEE Probe, Catheters, Rotalink Set	Expansion of minimally invasive and hybrid cardiac procedures; improved surgical precision and recovery.
Institutional Systems & Infrastructure	Web HMIS, C-Arm OT Table, Homograft Valve Bank, Mother Milk Bank Sets	Strengthened digital hospital systems, research infrastructure, and neonatal and maternal-child health support linkage.

This categorisation forms the foundation for the analytical framework to assess impact.



4 OBJECTIVES OF THE IMPACT ASSESSMENT

4.1 Rationale

As per the Ministry of Corporate Affairs (MCA) CSR Amendment Rules, 2021, companies with CSR projects exceeding INR1 crore or having CSR outlays over INR10 crore are required to undertake independent impact assessments. The assessment for the U. N. Mehta Institute of Cardiology & Research Centre (UNMICRC) was therefore undertaken to evaluate the outcomes and effectiveness of Gujarat State Petronet Limited's (GSPL) CSR contribution during FY 2020–21. The focus was to assess the real-world value and impact of advanced medical equipment deployed at UNMICRC - not just in terms of installation and financial utilisation, but in terms of enhanced institutional performance, patient care, and long-term sustainability.

4.2 Specific Objectives

The assessment sought to:

- **Verify** installation, operational use, and routine deployment of the supported equipment across clinical and critical-care areas.
- **Understand** how the equipment has contributed to *clinical decision-making, procedural conduct, and continuity of care*, particularly in high-acuity cardiac cases.
- **Examine** workflow and coordination improvements in ICUs, operation theatres, catheterization units, and neonatal care environments.
- **Capture** the perspectives of clinicians, technical staff, administrators, patients and caregivers regarding *care experience, safety, comfort, and accessibility*.
- **Assess** the contribution of the equipment to *institutional capability development*, including eligibility of complex cases, stabilisation pathways, and integration with public health access schemes.

The objectives were therefore focused on documenting *how the equipment functions in practice, the role it plays in routine and critical pathways, and the ways in which it interacts with the institution's clinical, operational, and public-care mandate*.



5 METHODOLOGY

5.1 Approach and Design

The assessment employed a mixed-methods approach, combining qualitative enquiry with structured validation of equipment installation, utilisation and maintenance records, to capture both operational efficiency and human experience. The methodology emphasised field-based evidence and stakeholder-led insights, recognising the clinical and operational nature of care equipment and services.

5.2 Sampling and Respondent Coverage

The assessment engaged respondents representing all key stakeholder categories associated with the CSR-supported equipment. These included:

- Senior doctors and consultants, who are the primary clinical users;
- Technical and operational staff, involved in the routine functioning and maintenance of equipment;
- Patients and caregivers, providing perspectives on service quality and overall experience. *(This was limited due to limited and difficult access)*

5.3 Data Sources

- In-depth interviews with respondent groups and key informants.
- Structured interaction with patients and caregivers, to understand treatment experience and access pathways *(limited)*.
- Review of facility-level documentation, including utilisation logs (where maintained), maintenance records, and operational deployment practices.
- Direct observation of selected clinical environments where equipment is routinely in use.

5.4 Data Collection Tools

Semi-structured interview schedules were used with respondent groups and key informants. The tools were designed to elicit experiences of clinical utility, workflow integration, decision-making implications, and service continuity. The instruments applied during fieldwork were all pre-tested at UNMICRC and administered by trained enumerators. The questionnaires and interview guides used in the study are included in Annexures.

5.5 Data Collection Process

- *Enumerator Training:* A team of qualified enumerators underwent a one-day induction at GITCO on ethics, interview techniques, device familiarisation, and recording standards.



- *Field Execution*: Fieldwork spanned mid-August to mid-September 2025, covering all relevant departments. Enumerators used both printed forms and secure digital tablets.
- *Field Observation*: Operational status checks, photographic documentation.
- *Data Recording & Coding*: A record-first, code-later method was used: enumerators transcribed verbatim field responses and later coded them in a controlled spreadsheet for quantitative analysis.

5.6 Approach to Analysis

Data was analysed using a thematic synthesis approach, in which recurring patterns across stakeholder groups were identified and grouped under clinical, operational, institutional, and patient-centred dimensions. Verbatim field expressions were retained where clarity allowed, to ensure that stakeholder perspectives are presented in their original meaning and tone.

5.7 Verification & Data Quality Assurance

Findings were cross-checked (*data triangulation*) across:

- Multiple respondent groups (clinical, operational, administrative, and patient-facing),
- Different functional areas (ICU, OT, Cath Lab, Neonatal, Ward recovery),
- Direct observation (*physical verification*) of equipment environment, to ensure internal consistency and avoid single-source interpretation.

5.8 Study Considerations and Contextual Limitations

The assessment was conducted with full cooperation from clinical, administrative, and technical teams. As with most evaluations situated within an active tertiary-care environment, certain contextual considerations shaped the form and depth of field engagement. These factors do not materially affect the validity of findings but are acknowledged for transparency and interpretive clarity.

Clinical Environment and Patient Confidentiality

Patient confidentiality protocols appropriately guided access to patient interaction. Where feasible, brief telephonic conversations were held with a small number of patients and caregivers, facilitated by clinical/administrative staff. Some respondents were able to recall and share their experiences clearly, while others provided limited or short responses. Accordingly, patient insights have been incorporated in a focused, non-exhaustive manner, to reflect lived experience without overgeneralisation.



Phased Adoption of High-End Systems

Certain advanced equipment—particularly those associated with complex cardiac or paediatric cases - undergo progressive integration as clinical teams build sustained familiarity, skill reinforcement, and case-volume suitability. The assessment therefore reflects current embedded utilisation, while recognising that long-term impact will continue to evolve.

Multiple Concurrent Institutional Support Streams

UNMICRC receives assistance under government health assurance schemes and additional CSR contributions. The assessment has therefore focused on the utilisation and contribution of GSPL-supported equipment within the broader treatment ecosystem, without attributing patient outcomes solely to a single support source.

Time-Bound Field Engagement

As a fully operational tertiary-care centre, clinical teams were available in structured intervals for interaction. The study design therefore emphasised depth, relevance, and representation across clinical and operational roles, rather than high-volume respondent counts.

5.9 Ethical Compliance

The assessment conformed to institutional ethics norms and MCA Impact Assessment protocols, with no conflict of interest. Respondent anonymity and confidentiality were maintained; photographs were taken only with consent.



6 FINDINGS AND ANALYSIS

The findings are organised thematically to reflect the nature of improvements observed across critical care, surgical and interventional services, workflow, patient experience, and institutional systems. All observations and interpretations are based on physical verification, equipment-wise field interactions, clinician and staff interviews, and review of utilisation records pertaining to FY 2020–21.

6.1 Installation and Operational Status Verification

All 28 equipment items supported under GSPL's CSR funding during FY 2020–21 were found to be *present, functional, and in active clinical stock and use across relevant departments* at UNMICRC. Physical verification and departmental deployment enquiry confirmed:

- Appropriate installation and integration within ICU, Cath Lab, Operation Theatres, Perfusion Services, Neonatal Units, and Support Service Units.
- Regular utilisation in routine, emergency, and high-acuity clinical operations.
- Availability of maintenance protocols and service support systems.

This establishes that the CSR-supported assets have moved beyond procurement and are embedded within everyday service delivery.

6.2 Strengthening of Critical and Emergency Care Capacity

GSPL's CSR-supported equipment - including ECMO systems, CRRT units, portable BiPAP ventilators, high-end ICU beds, and continuous cardiac output monitors - has strengthened UNMICRC's capacity to manage critically ill cardiac patients across ICU, step-down, and peri-operative settings.

Together, these systems have contributed to greater clinical control, physiological stability, and responsiveness during acute cardiac deterioration, post-operative recovery, and multi-organ support.

Key Observations

- Improved stabilisation of acute cardiac shock, respiratory distress, and multi-organ failure cases.
- Safer and smoother recovery environments for high-risk post-operative patients.
- Reduced manual strain on nursing staff and improved patient mobilisation support.
- More predictable monitoring and intervention pathways during the acute phase.



- Increased ability to maintain continuity of care in-house, without emergency referral delays.

Respondent doctors consistently highlighted that the integration and complementarity of these systems has been a key contributor to improved ICU workflow and decision-making.

BiPAP

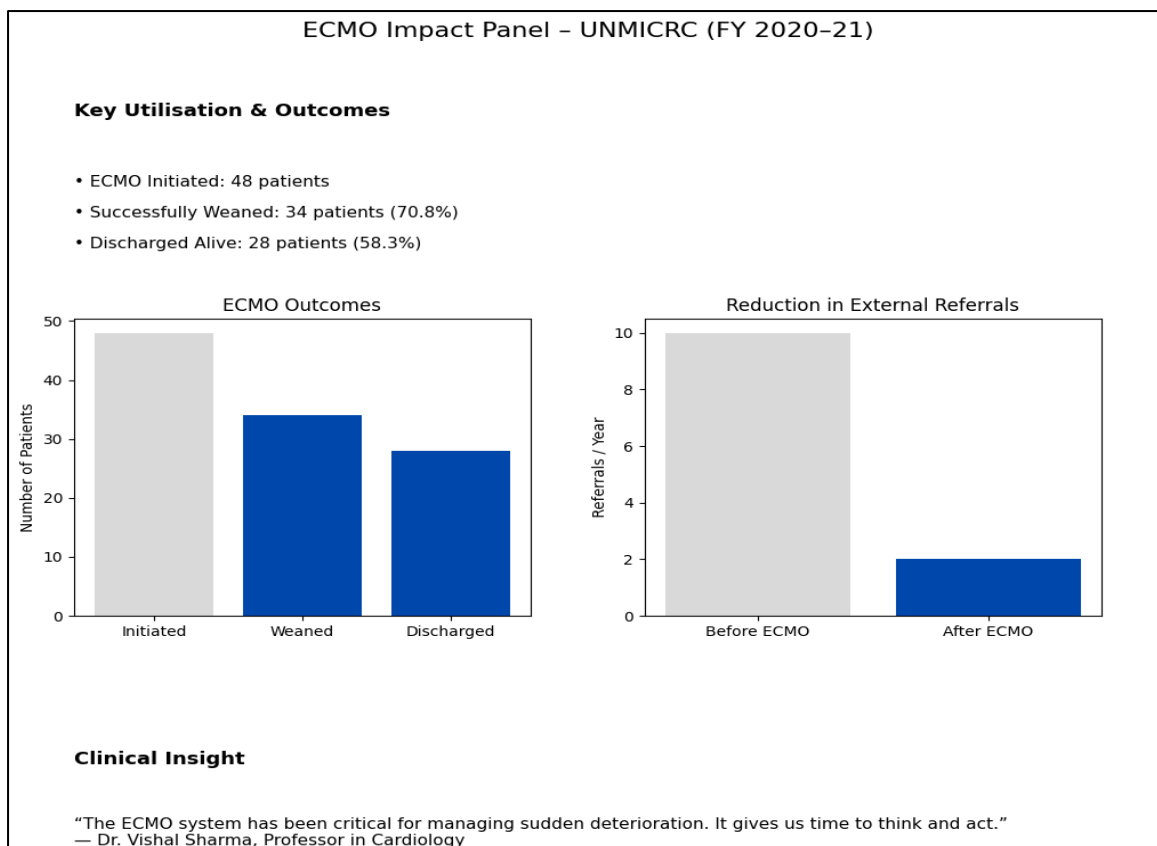
The BiPAP add-ons removed key limitations in non-invasive respiratory care by improving equipment readiness, continuity of use, and bedside efficiency. Enhanced pressure accuracy and patient-adaptive features improved tolerance to therapy, while battery-supported mobility ensured uninterrupted respiratory support during transfers and emergencies. Automation and expanded accessory availability reduced manual monitoring and eliminated delays caused by equipment sharing, strengthening workflow efficiency and responsiveness in respiratory care delivery.

ECMO System

The ECMO system has strengthened care continuity and clinical decision-making during high-acuity cardiac emergencies by providing a critical stabilisation window that enables timely assessment, multidisciplinary coordination, and in-house intervention. Clinical teams consistently reported that rapid ECMO initiation reduced dependence on emergency referrals, minimised transfer-related risks, and maintained continuity across diagnostic, critical care, and recovery stages.



Figure 6.1: ECMO Utilisation and Outcomes at UNMICRC (FY 2020–21) & Reduction in External ECMO Referrals (Before–After).



CSR-supported ECMO systems enabled in-house management of critically ill cardiac patients, with 70.8% successfully weaned and 58.3% discharged alive, reducing dependence on external referrals. In-house ECMO availability significantly reduced emergency referrals, mitigating clinical risk and financial burden associated with transfers

Source: Interviews + Recall + Records

ICU Motorized Beds with Pressure-Relieving Mattresses

The ICU motorized beds with pressure-relieving mattresses have contributed to measurable improvements in patient care, staff efficiency, and safety within critical care settings. The introduction of High-End Motorised ICU Beds has strengthened ICU care delivery by addressing long-standing limitations in patient positioning and comfort. Staff feedback and post-installation reviews indicate improved patient comfort, reduced pressure sore incidence, and lower physical strain on nursing personnel.



Table 6a: Observed Areas of Improvement Post Installation

Area	Observed Change
Patient comfort	Improved during long ICU stays
Pressure sore incidence	Reported reduction (30%)
Staff workload	Reduced physical strain
Emergency response	Faster due to CPR positioning
ICU workflow	More systematic, standardized

Post-installation reviews indicate a reported 30% reduction in pressure sore incidents following the deployment of motorised ICU beds.

Source: reviews + staff feedback

Cardiac Output Monitoring System

The expansion of the Cardiac Output Monitoring system (add ons) has strengthened both clinical decision-making and care continuity across operative and critical care settings. By upgrading sensors, software, and connectivity, the system now provides continuous, high-precision hemodynamic data, enabling earlier detection of instability and faster therapeutic response during high-acuity cardiac procedures. Clinicians reported more data-driven intraoperative and postoperative management, improved coordination across OTs and ICUs, and enhanced training opportunities for resident doctors.

Table 6b: CSR-Supported Enhancement of Cardiac Output Monitoring System

Dimension / Upgrade	Pre-CSR Status	Post-CSR Enhancement / Contribution
System configuration	Single base console	Expanded with add-on modules
Sensors & transducers	Outdated, limited accuracy	New-generation pressure & flow transducers enabling higher precision
Monitoring capacity	Limited simultaneous use	Parallel multi-patient monitoring across units
Data availability	Intermittent / basic	Continuous, real-time trend analysis
Software integration	Minimal	Updated integration software for live hemodynamic assessment
Departmental coverage	Restricted	ICUs, OTs, Cath Labs

Workflow continuity	Disrupted during patient transfers	Seamless OT–ICU handover via wireless interfaces
Training & calibration	Basic	Structured tools supporting sustained accuracy and staff readiness

The table reflects how CSR support strengthened continuous, high-precision cardiac monitoring within a public hospital, improving care continuity and access to advanced hemodynamic assessment for high-risk patients.

Source: *Clinician interviews + records + review*

IMPACT Narrative: Real-Time Cardiac Output Monitoring in High-Risk Valve Surgery

During a complex aortic valve replacement procedure on a 62-year-old patient, the CSR-upgraded cardiac output monitoring system was used to provide continuous, real-time assessment of cardiac performance throughout surgery. Unlike intermittent or basic monitoring, the upgraded system enabled the clinical team to track subtle intraoperative fluctuations in cardiac output as they occurred. When an early deviation in hemodynamic stability was detected, the anaesthesia team was able to initiate immediate therapeutic adjustments, preventing further deterioration and avoiding progression toward circulatory compromise.

The continuity of monitoring extended seamlessly from the operative phase into post-operative care, supporting stable hemodynamic management in the ICU. As a result, the patient demonstrated steady recovery parameters and was extubated approximately 24 hours earlier than anticipated. While individual outcomes are influenced by multiple clinical factors, this case illustrates how continuous, high-precision cardiac output monitoring supports earlier detection of risk, timely clinical response, and safer management during high-risk cardiac surgery.

Ventricular Assist System

The CSR-supported expansion of the Ventricular Assist System (console for Ventricular Assist Device) has strengthened UNMICRC’s capacity to manage severe cardiac failure within the institution by enabling longer-duration mechanical support, real-time monitoring, and simultaneous patient coverage. Faculty consistently described the upgrade as reducing reliance on external referrals while improving survival and stabilization in high-acuity cases. Importantly, the system now supports continuity across intraoperative, post-surgical, and recovery phases — a shift from earlier emergency-only deployment.



TABLE 6c: Baseline vs Post-CSR Functional Capacity of the Ventricular Assist Device (VAD) Console

Dimension	Before CSR Add-ons	After CSR Add-ons
System capability	Limited-duration cardiac support	Extended-duration circulatory assistance
Monitoring	Older modules; higher manual oversight	Real-time pressure & flow monitoring with alarm features
Patient capacity	Few cases at a time	Simultaneous multi-patient support
Operational reliability	Higher downtime risk	Reduced downtime with upgraded drive units
Transfer continuity	Vulnerable during movement	Battery-backed uninterrupted support
Clinical readiness	Primarily emergency bridging	Expanded stabilization capability

CSR-supported enhancements transitioned the VAD console from constrained emergency deployment to a continuously operable mechanical circulatory support system.

Source: Faculty interviews

TABLE 6d: Clinical Outcomes Observed Following VAD Console Upgrade.

Outcome Area	Observed Change
Survival in severe cardiac failure	Increased by ~25–30%
Referral dependency	Reduced
Hemodynamic stabilization	Achieved earlier
ICU recovery trajectory	Shortened
Complication risk	Lower with continuous monitoring

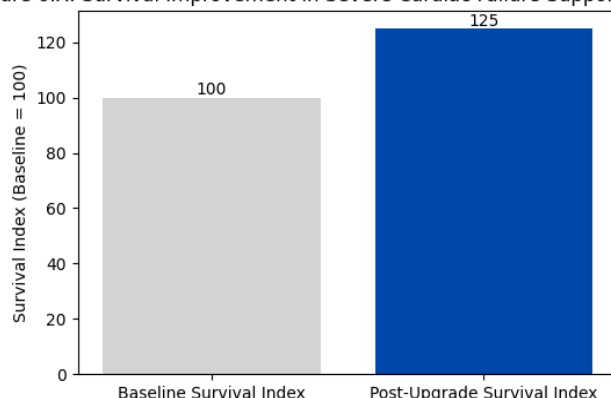
Improved survival alongside reduced referral dependency reflects strengthened in-house critical care capacity within the public cardiac care setting.

Source: Faculty insights



Figure 6.4: Survival Improvement in Severe Cardiac Failure Supported by VAD

Figure 6.X: Survival Improvement in Severe Cardiac Failure Supported by VAD



Faculty observations indicate an approximate 25–30% improvement in survival among severe cardiac failure patients supported by the upgraded VAD system.

VAD upgrades - additions including advanced monitoring modules, battery-backed drive units, additional pump consoles, and training - transformed mechanical cardiac support from limited emergency use into sustained, multi-patient critical care capability

CASE Story: Myocardial Recovery Following Prolonged Mechanical Support

A 38-year-old patient presenting with post-myocardial infarction heart failure required urgent circulatory assistance. Using the upgraded Ventricular Assist System, continuous mechanical support was sustained for nine days, allowing myocardial recovery without the need for transplant. Faculty noted that prior equipment limitations often necessitated transfer or resulted in poor outcomes for similar cases. The upgraded system enabled uninterrupted stabilization within the institution, demonstrating its role in preserving treatment continuity during critical cardiac events.

Snippets from Medical Staff:

“The ECMO system has been critical for managing sudden deterioration. It gives us time to think and act.”— Dr. Vishal Sharma, Professor in Cardiology

“Earlier, patients requiring ECMO were often transferred out, leading to delays and risk. With ECMO available in-house, we can initiate support immediately.”— Dr. Atul Gandhi, Chief Perfusionist

“In multi-organ failure and hemodynamic instability, standard dialysis is not suitable. CRRT allows slow and continuous support without disturbing blood pressure.”— Mrs. Kavita Patel, ICU Dialysis Nurse / Technical Staff

“Emergency response has become quicker with one-touch CPR positioning and emergency controls.”
— **ICU clinical team**

“The upgraded BiPAP systems now provide more accurate pressure delivery and better patient synchronisation, resulting in fewer episodes of desaturation and improved tolerance to non-invasive ventilation.”— **Clinical staff feedback, field interaction**

“Intraoperative safety has significantly increased, we can now monitor even subtle changes in perfusion and cardiac function during surgery.”— **Dr. Pooja Vyas, Professor in Cardiology**

“Post-procedure recovery and fluid management are now more data-driven, minimizing the risk of over- or under-resuscitation.”— **Dr. Vishal Sharma**

“Clinicians now make treatment decisions based on live cardiac performance data rather than intermittent readings.”— **Dr. Sahoo, Professor in Cardiology**

“The upgraded system has greatly improved the academic training environment for cardiology and anesthesia residents.”— **Dr. Vyas, Professor in Cardiology**

“The extended functionality (VAD) has enabled continuous care from critical support to stabilization phases within the same facility — avoiding risky transfers.”— **Dr. Gajendra Dubey, Professor in Cardiology**

Social & Equity Impact

- Local availability of ECMO reduced catastrophic out-of-pocket expenditure associated with emergency referrals to private centres, particularly benefiting low-income families.
- CRRT availability reduced mortality risk in complex ICU cases and prevented delays that disproportionately affect economically weaker patients reliant on public ICUs.
- The CSR-supported BiPAP enhancements have contributed to equitable access to advanced non-invasive respiratory care by reducing reliance on invasive ventilation and ICU admission. Improved continuity of respiratory support and reduced escalation needs are particularly beneficial for economically weaker patients dependent on public healthcare systems, where delayed intervention and ICU congestion disproportionately affect outcomes.
- The availability of continuous cardiac output monitoring within a public hospital setting contributes to more consistent access to advanced cardiac monitoring for patients from economically vulnerable backgrounds.
- Strengthening of the Ventricular Assist System has expanded in-house access to advanced mechanical circulatory support within UNMICRC, reducing dependence on



high-risk transfers and enabling timely, life-saving intervention for critically ill cardiac patients who might otherwise face structural barriers to specialised care.

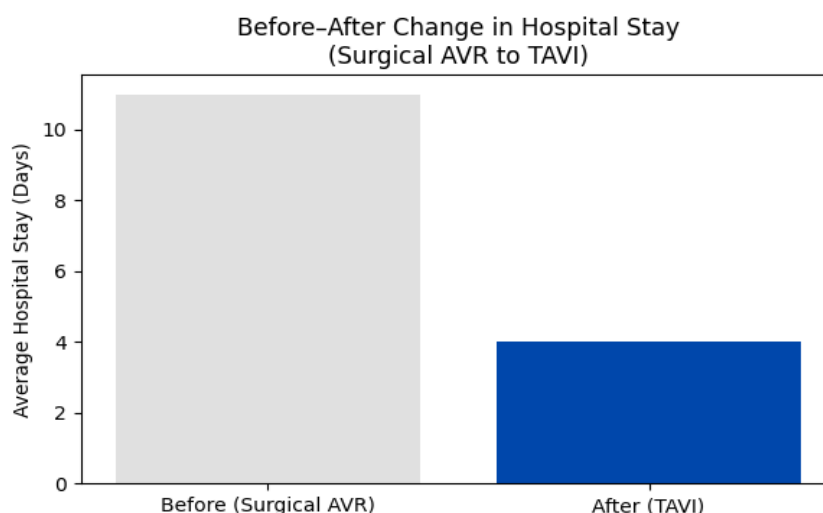
6.3 Enhancement of Surgical and Interventional Capacity

The CSR-supported surgical and interventional equipment — including TAVI systems, VAD console add-ons, valve prostheses, EVH systems, HTEE probes, homograft valve bank infrastructure, and adjunct catheterisation tools — has strengthened UNMICRC’s capacity to handle a broader, more complex, and previously higher-risk range of cardiac surgical cases. Clinicians reported that this significantly altered treatment eligibility for high-risk and elderly patients who were previously considered unsuitable for conventional open-heart surgery or were referred outside due to procedural risk and cost constraints.

6.3.1 Use of TAVI in High-Risk and Elderly Cases

Clinical teams noted that the availability of TAVI systems enabled **case selection driven by clinical need**, ensuring affordability did not become a limiting factor in eligible cases.

Figure 6.5: Reduction in Hospital Stay – Surgical AVR vs TAVI (Before–After depiction).



The chart demonstrates a reduction in average hospital stay from 10–12 days for conventional surgical aortic valve replacement to 3–5 days following CSR-supported TAVI procedures.

Source: Interviews + Recall + Records

This reduction has direct clinical and socio-economic relevance. Shorter hospitalisation lowers complication risk and reduces indirect costs borne by families, particularly significant for patients from economically weaker backgrounds dependent on daily wages.

Table 6e: Clinical Outcomes Observed in High-Risk TAVI Patients.

Outcome Area	Observed Change with TAVI
Survival	Improved (~90% reported)
Mortality & morbidity (high-risk)	Reduced by ~30%
Post-procedure recovery	Significantly faster
Post-operative complications	Reported decline
Quality of life	Improved functional independence

The table summarises faculty-reported improvements in survival, recovery, and functional outcomes among high-risk patients following the adoption of CSR-supported TAVI.

Source: Faculty insights + clinical recall

It was reported that the TAVI program was further strengthened through the use of advanced valve platforms such as the *Evolut-R system*, designed with a self-expanding nitinol frame and recapturable deployment capability. These features support controlled positioning during transcatheter implantation and allow intra-procedural adjustments where anatomical complexity is present.

Faculty observations indicate that the availability of such next-generation valve technology has contributed to improved procedural confidence and supported favourable recovery patterns among elderly patients undergoing transcatheter valve replacement. Exposure to Evolut R valves and system was also noted to enhance clinical training, enabling trainees to observe complex real-time procedures and strengthening advanced interventional skill development within the cardiology program.

CASE Story: TAVI in a Super-Elderly High-Risk Patient

An 82-year-old patient with severe aortic stenosis, previously deemed unfit for conventional surgery, underwent transcatheter aortic valve implantation (TAVI) at UNMICRC. The minimally invasive procedure enabled successful valve replacement despite elevated surgical risk. The patient demonstrated rapid recovery and resumed routine daily activities within two weeks, indicating strong functional improvement following intervention. This case illustrates how TAVI has expanded viable treatment pathways for super-elderly patients who may otherwise have had limited therapeutic options.



Snippets from Medical Staff:

“Procedures like TAVI have made it possible to treat elderly and high-risk patients who were previously considered unfit for surgery.”— Dr. Sibasis Sahoo, Professor in Cardiology

“Mortality and morbidity rates have reduced by nearly 30% in high-risk categories.”

— Dr. Chirag Doshi, Head & Professor, Department of Cardiovascular and Thoracic Surgery (CVTS)

“The Evolut-R TAVI system has transformed the management of elderly aortic stenosis patients, improving survival and recovery times dramatically.”— Dr. Gajendra Dubey, Professor in Cardiology

6.3.2 Sutureless Aortic Valves, Perimount Mitral Magna Ease Valve, and Operative Efficiency

Sutureless Aortic Valve

The addition of sutureless valve devices has strengthened operative efficiency by significantly reducing surgical duration and anesthesia exposure. Shorter cardiopulmonary bypass time is particularly relevant for elderly and high-risk patients, where procedural tolerance is often limited. Faculty observations indicate that these efficiencies have supported safer surgical management while enabling improved operating room utilisation.

Table 6f: Operative and Clinical Efficiency Gains with Sutureless Aortic Valve

Parameter / Clinical Dimension	Observed Impact
Surgical time	Reduced by ~40–45 minutes
Need for suturing	Eliminated, simplifying valve implantation
Anesthesia exposure	Lower due to shorter operative duration
Postoperative recovery	Faster recovery observed
OT efficiency	Greater surgical throughput per operating schedule
Elderly patients	Improved surgical tolerance
Multi-procedure cases	Enhanced procedural feasibility
Complication risk	Lowered through reduced bypass duration
Recovery trajectory	Shortened

The table indicates that sutureless valve technology contributed to shorter operative duration and improved procedural tolerance, supporting safer surgical management in high-risk patient cohorts. It was reported that sutureless valve replacements have made it possible to treat elderly and high-risk patients who were previously considered unfit for open-heart surgery.

Source: Faculty input + Clinical insights



Perimount Magna Ease Valve

The Perimount Magna Ease valve has supported improved postoperative hemodynamic and functional recovery among valve replacement patients. Faculty observations suggest enhanced cardiac output and reduced regurgitation, contributing to improved activity levels within months of surgery. CSR-supported procurement ensured that high-quality prosthetic material remained accessible within the public-sector hospital, reinforcing treatment equity without compromising clinical standards.

Snippets from Medical Staff:

*“...If I use this suture-less valve, it will be done in 20 minutes — I can easily save my patients 40 valuable minutes.... Average surgical time reduced by nearly 45 minutes, leading to lower anesthesia exposure and faster postoperative recovery.”— **Dr. Chirag Doshi***

*“CSR support enabled treatment of economically weaker patients without compromising prosthetic quality.”— **Dr. Ketav Lakhia, Professor in Cardio Vascular Thoracic Surgery***

Social & Equity Impact

CSR-supported procurement of advanced valve technology enabled high-risk patients, including those from economically weaker backgrounds, to receive timely surgical intervention without compromise in prosthetic quality.

6.3.3 Homograft Valve Bank and Paediatric Continuity

Homograft Valve Bank

The Homograft Valve Bank has reduced procedural uncertainty associated with donor tissue availability, enabling timely surgical decision-making for complex cardiac conditions such as infective endocarditis and congenital valve defects. Faculty inputs indicate that surgeries once deferred are now operationally feasible, reflecting a shift from resource-dependent scheduling to preparedness-driven intervention. With over 100 critical patients supported annually, the initiative represents long-term institutional capacity creation rather than episodic clinical support. Clinical teams highlighted the importance of homograft valves in supporting surgical management of paediatric patients and infective valve conditions, where timely access to suitable biological tissue is essential. The availability of an in-house Homograft Valve Bank has strengthened the institute’s regional referral capability for biological valve replacement.

Operational Insight

- **Over 100 critical patients** supported annually
- Surgeries previously deferred are now feasible



- Paediatric access to biological valves strengthened
- Institutional surgical readiness enhances.

Snippets from Medical Staff:

“...Previously, such surgeries were deferred due to non-availability of compatible tissue valves.... The bank now enables timely interventions, especially for paediatric and young adult cases requiring biological replacements.” — Dr. Kartik Patel, Professor in Cardio Vascular Thoracic Surgery and Pulmonary Homograft Implantation

Social & Equity Impact

- The availability of homograft valves has strengthened in-house surgical readiness, ensuring that patients requiring urgent biological valve replacement can receive life-saving intervention without referral-related delays or financial escalation.

6.3.4 (HTEE) probe, (EVH) system, adjunct Catherization tools and Precision Enhancement

Hemodynamic Transoesophageal Echocardiography (HTEE) probe

The Hemodynamic Transoesophageal Echocardiography (HTEE) probe, Endoscopic Vessel Harvesting (EVH) system, RF Optitorque – Tiger Catheter, and the Rotalink–Rotawire system collectively support safer surgeries, streamlined diagnostics, and improved readiness for complex cardiac procedures.

The combined deployment of precision imaging, minimally invasive surgical tools, and advanced coronary intervention technologies reflects a measurable strengthening of procedural safety and treatment capability at the institution. Faculty observations consistently point toward improved surgical control, earlier diagnosis, expanded eligibility for complex interventions, and more coordinated intraoperative care. Importantly, the local availability of these technologies reduces escalation pathways for patients requiring advanced cardiac procedures, supporting continuity of care within the same facility.

Table 6g: CSR-Supported Technologies Strengthening Procedural Precision and Coronary Capability

Technology	Primary Clinical Role	Observed Institutional Contribution
HTEE Probe	Real-time intraoperative cardiac imaging	Improved surgical precision, multidisciplinary coordination, and patient safety
EVH System	Minimally invasive vessel harvesting for CABG	Reduced infection risk, improved healing, shorter hospital stays (~2–3 days), optimized OT utilization
Tiger Catheter	Single-catheter coronary angiography	Reduced procedural time, minimized catheter exchanges, lower radiation exposure, improved patient comfort

Rotalink–Rotawire	Plaque ablation in calcified arteries	Expanded treatment eligibility and enabled local management of complex coronary disease
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Collectively, these technologies indicate a capability shift toward precision-guided surgery and comprehensive coronary intervention within the institution. Faculty reported that plaque-modification capability through the Rotalink–Rotawire system has enabled successful revascularization in patients with heavily calcified coronary arteries who were previously unsuitable for conventional angioplasty, allowing advanced cases to be managed within the institution.

Source: Faculty insights

Snippets from Medical Staff:

“The HTEE probe provides real-time cardiac imaging during surgeries, enhancing surgical precision and safety.” — Dr. Pooja Vyas

“It allows for minimally invasive harvesting of veins for CABG procedures, reducing incision size, postoperative pain, and infection risk.” — Dr. Ashish Madkaiker; Dr. Ketav Lakhia

“It allows both left and right coronary imaging with a single catheter — reducing patient discomfort and procedural time.” — Dr. Vishal Sharma; Dr. Ketav Lakhia

“Availability of Rotalink systems has empowered the cardiology unit to handle advanced coronary cases locally, reducing patient referrals to higher-cost metro hospitals.” — Dr. Vishal Sharma; Dr. Pooja Vyas

Social & Equity Impact

- Availability of advanced surgical and coronary technologies (made available through CSR support) has expanded access to precision-driven cardiac care within UNMICRC, reducing financial and geographic barriers that often delay treatment for economically vulnerable patients.

6.3.5 CSR- C-Arm Compatible OT Table and Hybrid Cardiac Infrastructure Strengthening

C-Arm Compatible OT Table

The installation of the C-Arm compatible OT table has strengthened UNMICRC’s hybrid cardiac intervention capability by integrating surgical precision with real-time imaging within a single procedural environment. Measurable reductions in procedure time, intraoperative repositioning, and ICU stay indicate improved workflow synchronization and perioperative efficiency. Concurrently, the increase in hybrid procedure volume and annual patient throughput reflects expanded institutional capacity to manage complex cardiovascular cases



in-house. Faculty observations further highlight enhanced imaging quality, improved safety, and reduced radiation exposure.

Table 6g: Procedural Efficiency Gains Following Installation of C-Arm Compatible OT Table

Parameter	Before	After	Change Observed
Average procedure time (pacemaker/ICD)	105 minutes	85 minutes	↓ 19%
Hybrid cardiac/peripheral procedures per month	28–30	42–45	↑ ~50%
Intraoperative repositioning per case	3–4	1–2	↓ ~50%
Postoperative ICU stay (hybrid cases)	2.8 days	2.1 days	↓ 25%
Fluoroscopic image quality (1–5)	3.8	4.7	↑ 24%
Annual patient throughput	~4200	~4900	↑ 17%

The C-Arm compatible table measurably improved procedural efficiency, imaging quality, and hybrid surgical capacity within the cardiac OT complex.

Source: Department records + faculty inputs

Table 6g: Institutional Capacity Expansion Enabled by Hybrid OT Infrastructure.

Dimension	Observed Institutional Effect
Workflow integration	Enabled simultaneous surgical–interventional procedures
Infrastructure capability	Reduced dependence on external hybrid labs
Academic environment	Strengthened postgraduate training exposure
Resource utilization	Improved Cath Lab and OT scheduling efficiency
Service positioning	Reinforced role as a regional centre for complex cardiac care

Hybrid infrastructure has transitioned the OT from a single-modality surgical space to an integrated cardiac intervention environment.

Source: Faculty insights + operational review

Snippets from Medical Staff:

“The integration of surgical and imaging functions in one setup has streamlined our workflow and reduced procedure turnaround time.”— Dr. Vishal Sharma

“The system’s flexibility has reduced procedural delays, minimized radiation exposure, and improved overall patient safety.”— Dr. Pooja Vyas



Social & Equity Impact

- Hybrid OT infrastructure has enabled advanced cardiac procedures to be performed locally within UNMICRC, reducing reliance on higher-cost private facilities and supporting timely treatment for patients dependent on government-funded/ subsidized care schemes.

The CSR-supported medical equipment has contributed to a progressive strengthening of clinical capability at the institution - spanning emergency stabilization, advanced surgical care, precision-guided procedures, and complex coronary interventions. The availability of these technologies has supported safer clinical pathways, expanded treatment eligibility, and improved continuity of care by enabling a greater proportion of critical cases to be managed in-house.

6.4 Digital Infrastructure Strengthening: Web-Based Hospital Management Information System (Web-HMIS)

Web-HMIS

Clinical and administrative staff described Web-HMIS as supporting continuity of patient information across departments. Web-HMIS operates as a system-wide enabler, influencing clinical workflows, administrative governance, research capability, and patient experience simultaneously. It has resulted in measurable improvements in administrative speed, data reliability, and clinical coordination at UNMICRC. Beyond process efficiency, the system has strengthened institutional capability through improved audit readiness, structured research data availability, and real-time operational oversight.

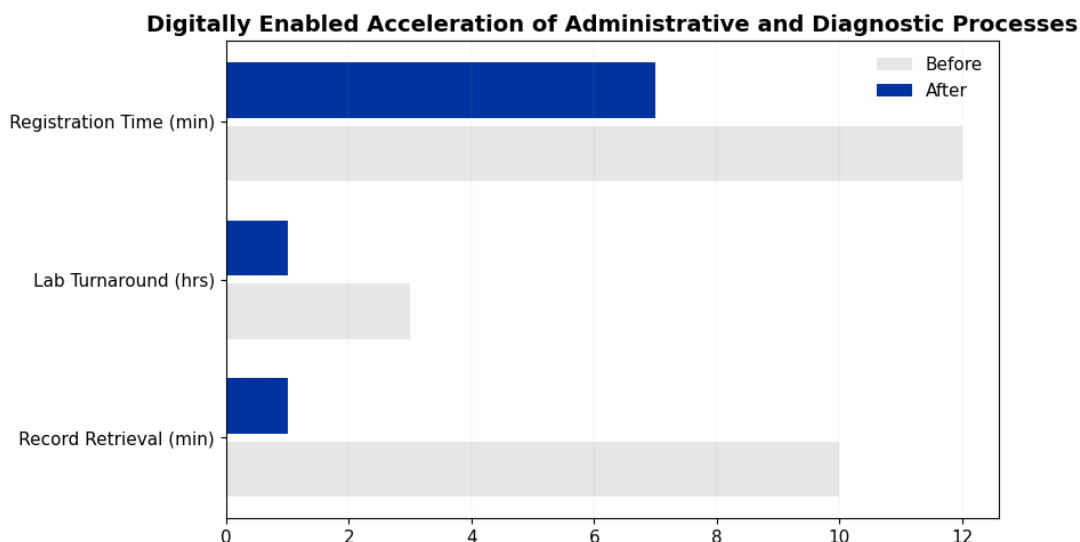
Table 6h: Institutional Capability Strengthened through CSR-Supported Web-HMIS

Capability Area	Observed Contribution
Clinical continuity	Real-time access to EMR and diagnostic data
Administrative accuracy	Reduced billing and inventory discrepancies
Data governance	Automated analytics and MIS dashboards
Audit readiness	Enhanced transparency and traceability
Research ecosystem	Structured datasets for clinical studies
Public health integration	Alignment with government reporting systems
Scalability	Cloud-ready architecture for future expansion

Web-HMIS implementation significantly accelerated administrative and diagnostic processes, reducing waiting time and improving care continuity.

Source: Institutional inputs + system review

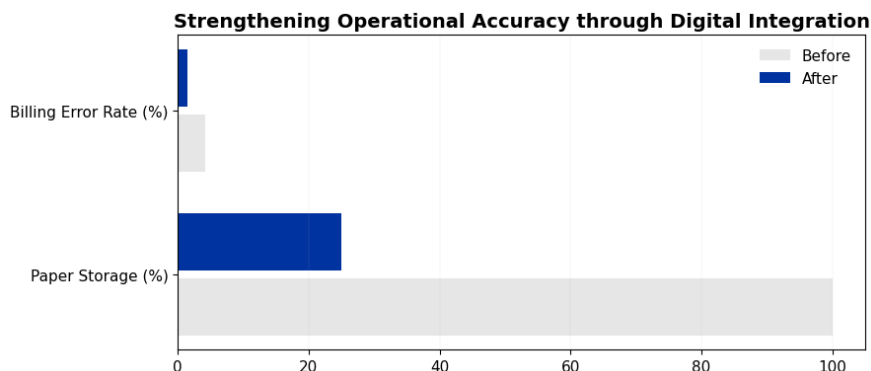
Figure 6.6: Acceleration in Patient Administrative Processes



Web-HMIS implementation significantly accelerated administrative and diagnostic workflows, reducing waiting time and improving care continuity.

Source: Interviews + Recall + Records

Figure 6.7: Reduction in Errors and Paper Dependency



Digital integration reduced administrative discrepancies and reliance on physical records, strengthening operational accuracy.

Source: Interviews + Recall + Records



Figure 6.8: Improvement in Patient Experience



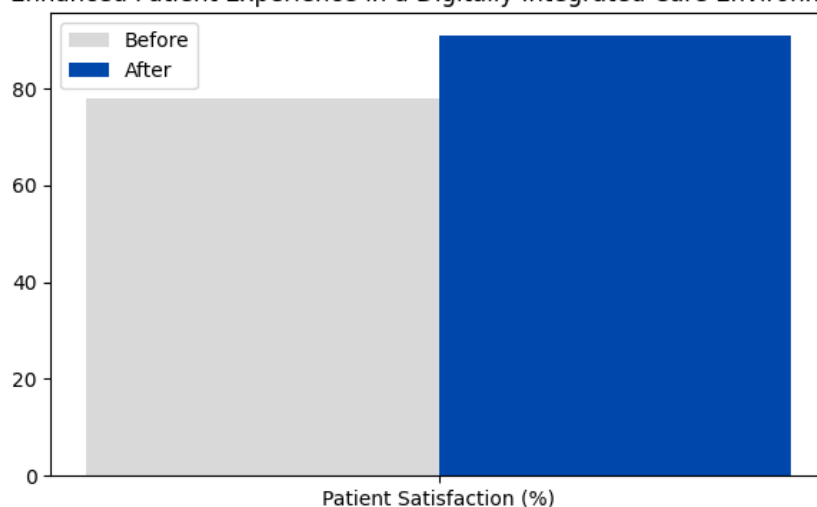
Higher satisfaction scores reflect improved patient experience following reductions in administrative delays.

Source: Interviews

Figure 6.9: Digitally Integrated Care Pathway Enabled by Web-HMIS.

CSR-supported Web-HMIS enabled end-to-end digital integration across clinical and administrative workflows.

Enhanced Patient Experience in a Digitally Integrated Care Environment



Snippets from Medical Staff:

“Web-HMIS has made data retrieval easier across clinics and wards. Patient history is accessible without searching physical files.” - **Administrative Staff**

“There is better coordination between departments when information flows digitally.” - **Nursing Staff, Step-Down Unit**

Social & Equity Impact

- Digital integration (CSR-enabled) through Web-HMIS has strengthened UNMICRC’s capacity to deliver timely, coordinated, and high-volume cardiac care by reducing administrative delays, improving data accessibility, and enhancing care continuity — thereby supporting more equitable service delivery for large patient populations who rely primarily on public-sector tertiary healthcare.



6.5 Strengthening Neonatal Care Continuity: Mother Milk Bank

The Mother Milk Bank at UNMICRC was supported through CSR funding from GSPL for the procurement of specialized equipment during FY 2020–21. The facility became operational on 22 April 2022. While infrastructure was established earlier, full-scale operational utilization has been observed more recently, with consolidated performance data available for 2025, indicating that the facility has transitioned from establishment to active service delivery.

The Mother Milk Bank was established to ensure uninterrupted access to safe human milk for hospitalized infants unable to breastfeed due to illness, prematurity, post-surgical conditions, and mothers who cannot lactate due to illness or surgery. Since commencing operations on April 22, 2022, the facility has demonstrated steady scale-up, with active participation from approximately 175–200 mothers weekly, reflecting increasing awareness and normalization of milk donation within the hospital ecosystem.

By institutionalizing screened donor milk, pasteurization protocols, and controlled storage, the facility has strengthened neonatal nutrition pathways and reduced reliance on formula feeding. Operational evidence indicates sustained maternal participation, structured safety processes, and consistent daily supply - positioning the milk bank as a critical component of hospital-based neonatal care infrastructure. The integrated *MOM–DHM (Mother’s Own Milk - Donor Human Milk) model* prioritizes mother’s milk while maintaining donor milk as a medically governed fallback, ensuring uninterrupted nutritional access during critical recovery periods.

Table 6i: Mother’s Own Milk (MOM) – Cumulative Performance

Indicator	Total
Mothers Served	4,876
MOM Received	11.1 million ml
MOM Dispatched	8.35 million ml
Milk from Mother Donors	2.52 million ml
Milk from Employee Donors	239,090 ml
MOM Stored	2.76 million ml

Reporting Period: February 2025 – August 2025. The scale of milk collection and dispatch indicates sustained institutional utilization and strong maternal participation, positioning the milk bank as a high-dependency nutritional support mechanism within neonatal care pathways.

Source: Milk Bank Operational Records

Institutional responses indicate that donor milk availability has:

- *Reduced dependence on formula feeding*



- *Supported safer recovery among medically vulnerable infants*
- *Strengthened infection prevention practices*
- *Improved survival prospects in hospitalized neonates*

The facility currently supplies **approximately 5 litres of donor human milk daily** to infants requiring nutritional support, emphasising routine clinical integration.

Table 6j: DHM Processing and Utilisation Summary.

Indicator	Value
Total Batches Processed	882
Pasteurisation Batches	63
Milk Pasteurised	237,136 ml
Milk Dispatched	231,636 ml
Neonates Benefited	914
Pre-Pasteurisation Rejections	0
Post-Pasteurisation Rejections	0

Reporting Period: July–September 2025. Zero rejection rates reflect strong adherence to microbiological safety protocols - a foundational requirement for neonatal feeding programs.

Source: Milk Bank Operational Records

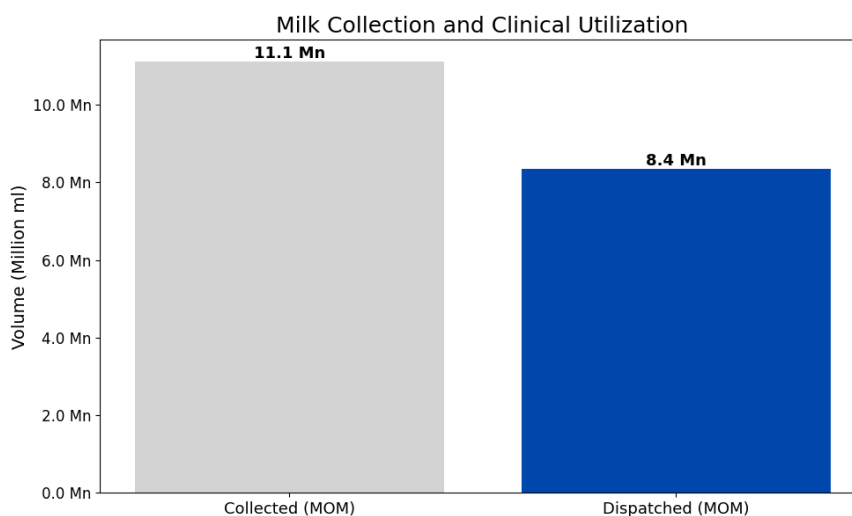
Social Impact Outcomes

1. Nutritional Continuity for High-Risk Infants

The facility supports infants unable to feed orally due to illness or surgery.



Figure 6.10: Milk Collection and Clinical Utilization.

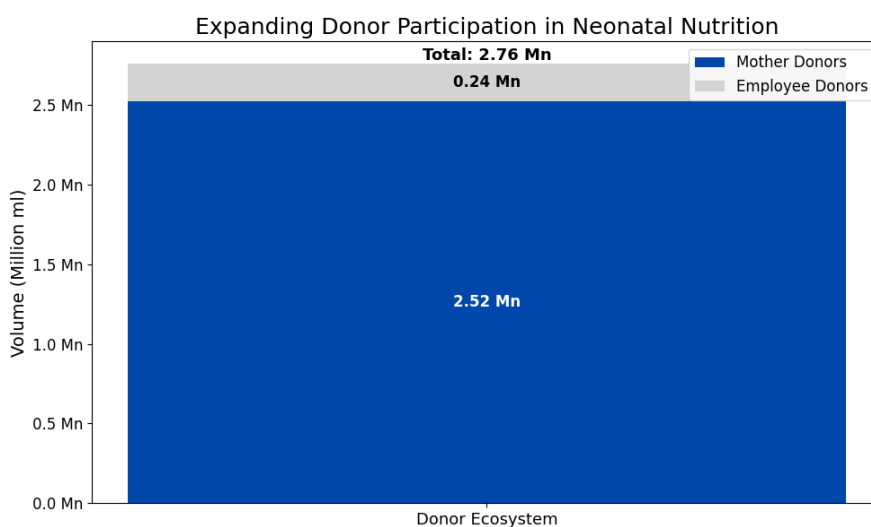


High dispatch volumes relative to collection reflect sustained neonatal demand and active integration into care pathways.

2. Institutional Participation

Milk contributions from employees indicate internal awareness and acceptance.

Figure 6.11: Expanding Donor Participation in Neonatal Nutrition.



Institutional participation alongside maternal donation reflects growing awareness and normalization of human milk donation.

3. Emergence of Donor Culture

Counselling-based engagement has normalized donation as a voluntary, life-supporting act.



4. Community Reciprocity

Beneficiaries are transitioning into contributors, demonstrating trust in the system.

CASE Story - From Care Recipient to Life-Giver: A Mother's Contribution Beyond Treatment

Bhuvnesh Sonar, a 1.5-year-old child from Ahmedabad, underwent successful surgical closure of a Ventricular Septal Defect and continues to recover well under routine paediatric cardiac follow-up, with stable vitals and no immediate post-operative complications.

What distinguishes this case is the mother's voluntary decision to donate breast milk to the Mother Milk Bank after receiving counselling and providing informed consent. Her donation is supporting nutritionally vulnerable infants — including premature and critically ill babies — reinforcing the role of donor milk in neonatal recovery pathways.

This case reflects a deeper institutional outcome: beneficiaries of advanced paediatric care evolving into contributors to the hospital's social care ecosystem. It demonstrates how CSR-enabled healthcare infrastructure can catalyse community participation, strengthen trust in institutional systems, and create a cycle of care where recovery extends beyond the individual child to support many others.

Together, these patterns suggest behavioural acceptance - a critical success factor for milk banking programs in culturally diverse settings. **(Observational Insight)**

Snippets from Medical Staff:

"Human milk is essential for recovery in infants after cardiac surgery." — **Neonatal Nurse, Paediatric Cardiac Ward**

"Families feel reassured when we tell them safe donor milk is available." — **Senior Nursing Staff, Neonatal Care**

Beneficiary VOICE

"My baby was critical and needed surgery, but I had severe lactation problems. Along with treatment, the hospital provided donor milk through the Mother Milk Bank, which helped my baby recover faster. With regular counselling from doctors, nurses, and peer mothers, my milk flow improved and I was able to breastfeed naturally after discharge."

"My newborn required urgent heart surgery and was very weak after the procedure. The Mother Milk Bank provided donor milk when I could not produce enough, which helped my baby gain strength and recover faster."



“During the hospital stay, the Mother Milk Bank supported the baby with donor milk, and with proper counselling, the mother’s milk flow improved, allowing us to continue breastfeeding after discharge.”

Beyond neonatal feeding, the Mother Milk Bank contributes to broader system strengthening:

- Supports post-operative paediatric cardiac care
- Enables safer recovery environments
- Enhances caregiver reassurance
- Builds community participation through donation
- Advances neonatal care standards within the public sector

The program also positions the institution within a growing national movement toward structured human milk banking.

Figure 6.12: Human Milk Pathway Enabled by CSR-Supported Infrastructure at UNMICRC Milk Bank.



The structured milk handling pathway demonstrates clinical-grade safety and institutional protocolization.

Table 6k: Quality and Safety Controls at UNMICRC Milk Bank, ensuring Clinical Process Integrity.

Parameter	Observed Status
Donor screening	Regular serological testing
Pasteurisation protocol	62.5°C for 30–45 minutes
Storage	–20°C (up to 6 months)
Traceability	Batch-wise documentation

Such protocolization indicates institutional maturity and reduces clinical risk in neonatal nutrition management.

Forward View (field interaction and observation derived insight)

Rising volumes and batch processing loads indicate approaching capacity thresholds, with future requirements including:

- Expanded pasteurisation infrastructure
- Additional cold-chain storage



- Skilled technical personnel
- Continued donor awareness initiatives

Sustained CSR engagement could play a catalytic role in scaling this high-impact service.

6.6 Patient Experience and Service Access

The assessment captured patient and caregiver perspectives reflecting *comfort, reassurance, and access to advanced cardiac care without financial exclusion*, facilitated by the hospital's integration with state-supported health schemes.

Interactions with patients and caregivers indicated:

- Greater comfort and confidence in the treatment environment.
- Reduced emotional and logistical strain during critical stages of treatment.
- Trust in the continuity and attentiveness of care, attributed to bedside monitoring and support systems.
- Meaningful reduction in financial barriers, allowing uninterrupted treatment for economically vulnerable households.
- Perceived dignity and reduced distress during recovery in ICU and step-down wards.

The improvements observed relate beyond clinical outcomes to *the lived experience of care and recovery*.

Data excerpts from Patients & Caregivers

“The treatment was explained to us, and we could see that the monitoring was continuous. It gave us confidence.” - Caregiver

“Recovery was smoother because the patient did not have to be moved much. The bed and machines were all there.” - Family Member, Post-Operative Ward

“We could not have afforded this treatment privately. Here, we were able to continue without interruption.” - Patient, State Health Scheme Beneficiary

Caregivers consistently reported relief from the burden of managing treatment logistics and financial decisions during a period of medical stress.



6.7 Summary of Findings

The CSR-supported medical systems from GSPL have:

- **Strengthened UNMICRC's ability** to manage high-risk cardiac cases.
- **Enhanced precision and safety** in both critical care and surgical settings.
- **Improved operational efficiency and responsiveness** across departments.
- **Supported equitable access** to advanced cardiac treatment, particularly for vulnerable patient segments.
- **Contributed to institutional capability-building** in a way that supports long-term growth.

The *analytical outcomes are evidence-based*, and reflect meaningful enhancement of cardiac and critical care capacity at UNMICRC.



7 IMPACT INTERPRETATION AND OUTCOMES FRAMEWORK

The outcomes observed during the assessment indicate that the medical equipment supported under GSPL's CSR initiative during FY 2020–21 has contributed to *improvements across multiple dimensions of service delivery* at UNMICRC. These outcomes are interpreted below in terms of their *clinical, operational, institutional, and social significance*.

7.1 Clinical Service Delivery Outcomes

The introduction of advanced critical care, monitoring, and surgical systems has supported:

- *Improved patient stabilisation in emergency and ICU settings, with equipment enabling more controlled, continuous, and responsive care.*
- *Enhanced ability to manage complex and high-risk cardiac cases, including patients who previously had limited treatment options.*
- *More precise surgical and interventional decision-making, supported by real-time monitoring and minimally invasive tools.*
- *Improved post-operative recovery experience, particularly where mobility, pain management, and ventilatory support systems were involved.*

These outcomes reflect incremental yet meaningful gains in *clinical safety, continuity of care, and procedural confidence* among clinical teams.

7.2 Institutional Capacity and Systems Strengthening

The equipment enhanced institutional capability in ways that extend much beyond patient outcomes:

- *Expanded procedural and interventional scope, allowing more advanced surgeries and high-acuity cases to be treated within the Institute.*
- *Improved workflow efficiency and resource organisation, particularly in ICU operations and OT scheduling.*
- *Reduced dependency on external referrals, supporting continuity of care within the state.*
- *Strengthened nursing, and surgical skill ecosystems, through practical exposure to high-end equipment and treatment protocols.*

These developments support *long-term institutional maturity* and contribute to UNMICRC's role as a leading public cardiac-care institution.



7.3 Patient-Centred and Social Equity Outcomes

Consistent with UNMICRC's service mandate and state-supported health coverage:

- *Patients from lower-income backgrounds accessed high-cost cardiac interventions without financial exclusion.*
- *Neonatal care improvements reduced distress and enhanced comfort during vulnerable stages of recovery.*
- *The availability of human milk support for infants safeguarded nutritional continuity, supporting post-operative survival and stability.*
- *Patient and caregiver feedback reflected trust in the institution, shaped by both clinical competence and supportive care environment.*

These outcomes highlight the *equity dimension of the intervention*, enabling access to advanced cardiac care irrespective of socioeconomic background.

7.4 Alignment with GSPL's CSR Priorities

The outcomes observed align directly with the CSR focus area of Healthcare & Sanitation under Schedule VII of the Companies Act, 2013, and with GSPL's stated commitment to supporting public health infrastructure and service delivery systems in Gujarat.

The intervention contributes to:

Alignment Target	Contribution Observed
SDG 3 - Good Health and Well-being	<i>Strengthened capacity for critical and cardiac care; improved access to life-saving treatment.</i>
SDG 9 - Industry, Innovation and Infrastructure	<i>Enhancements in medical technology, workflow and systems integration.</i>
SDG 17 - Partnerships for Sustainable Development	<i>Effective collaboration between GSPL and UNMICRC to address state- and nationwide cardiac and critical care needs.</i>

The impact is therefore both *clinical and structurally developmental*, consistent with GSPL's long-term CSR orientation.

7.5 Overarching Clinical Perspective on Service Strengthening

Senior doctors consistently described the equipment supported under GSPL's CSR funding as contributing to a more stable, adaptable, and preparedness-oriented clinical environment. The systems have *reduced clinical hesitation in complex case selection, improved team readiness during high-acuity episodes, and supported continuity of care* within the institution.



“This supports the model of advanced care in a public hospital setting.” - **Senior Faculty, Cardiac Sciences**

7.6 Institutional Growth and Training Ecosystem

Faculty noted that the equipment also contributes to skill enhancement and clinical exposure among trainees, fellows, and junior doctors.

“When the systems are available, training and exposure improve naturally.” - **Senior Faculty, Cardiac Sciences**

This reflects *long-term institutional strengthening*, supporting not only current service delivery but also *future specialized workforce development* in public cardiac care.



8 CONCLUSION

The assessment indicates that the medical equipment supported under GSPL's CSR initiative during FY 2020–21 has been *fully integrated into clinical operations* across critical care, surgical, and neonatal support services at UNMICRC. The systems are actively used, routinely maintained, and embedded into workflow practices.

The equipment has contributed to *greater treatment readiness, expanded eligibility for complex interventions, and more stable post-operative and critical care environments*. Importantly, the support aligns with UNMICRC's role as a public tertiary cardiac centre, where advanced cardiac interventions are delivered *without financial exclusion*.

The observed outcomes reflect institutional continuity and service maturity rather than short-term benefit. The systems are in daily use, and the improvements noted are practical and embedded - influencing decision-making, case handling, and patient experience at multiple touchpoints. The assessment also highlights a cohesive team-based culture, where clinicians, nursing staff, perfusion teams and administrative personnel operate with shared understanding of care priorities.

Altogether, the *outcome interpretations* suggest that the CSR support extended by GSPL during FY 2020–21 has played a meaningful role in strengthening cardiac and critical care readiness and delivery at UNMICRC, with benefits that are:

- **Operational** (*better-managed clinical environments*),
- **Institutional** (*expanded capacity and procedural capability*), and
- **Social** (*improved access and reduced inequity in advanced care*).

The outcomes align with the Institute's positioning as a public tertiary-care centre and contribute toward sustained cardiac-care advancement in the state. This positions the CSR-supported intervention as a part of *long-term cardiac and critical care capability development*, consistent with UNMICRC's academic and public health mandate.



9 RECOMMENDATIONS AND FORWARD PATH

Based on the field interactions and observations, it is evident that the equipment supported through GSPL's CSR contribution has been integrated meaningfully into UNMICRC's care pathways. The systems are in active use across critical care, surgical, interventional, neonatal, and post-operative settings, and teams have developed familiarity and confidence in their application. As the Institute continues to expand its clinical capacity and case complexity, the sustained value of these systems will continue to grow.

Going forward, the continuity of this impact may be further strengthened through ongoing internal knowledge-sharing and cross-team exposure, particularly as newer staff rotate into high-dependency units. Where equipment is used in niche or advanced cases, peer support and experience-based handholding can support wider comfort and uptake over time. Routine maintenance, periodic calibration reviews, and continued alignment between clinical teams and administrative coordination will help ensure that the operational reliability of equipment remains uninterrupted.

As the Homograft Valve Bank, Mother Milk Bank, Web-HMIS platform, and critical-care systems continue to mature within the institutional ecosystem, they may also offer opportunities for documenting good-practice processes and internal learning. These can inform future planning and help the Institute further consolidate its role as a centre of excellence in cardiac care.

In this context, the contribution made under GSPL's CSR support has not only enabled availability of equipment but has also supported the strengthening of care continuity and preparedness. The ongoing utilisation of these systems within clinical decision-making and patient care signifies a positive and continuing trajectory of impact.

The assessment indicates that the systems are performing well, appropriately deployed, and effectively integrated. The recommendations are not corrective in nature - they acknowledge good practices in place and point to opportunities for continued consolidation.



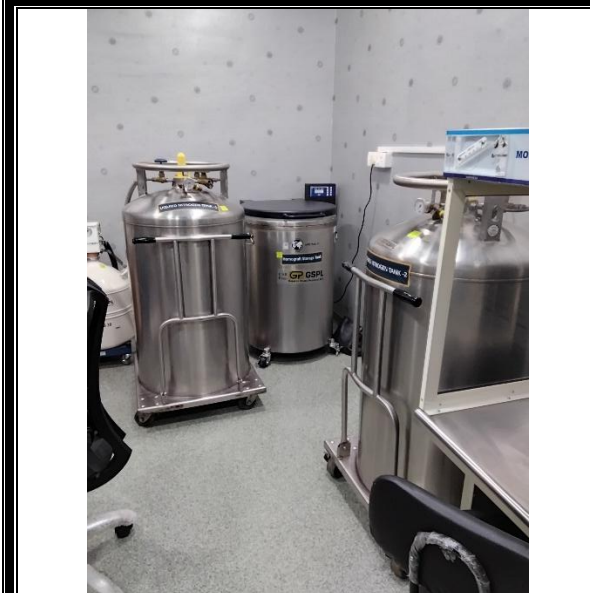
LIST OF ANNEXURES

1. List of Equipments UNMICRC FY 2020-21
2. Case Studies & Field Observation
3. Case Studies & Field Observation: Neonates
4. Question Set Survey
5. Answer Set Survey

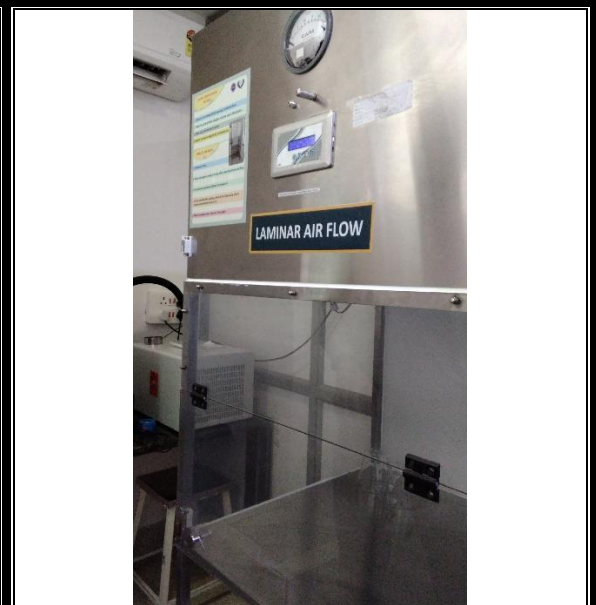
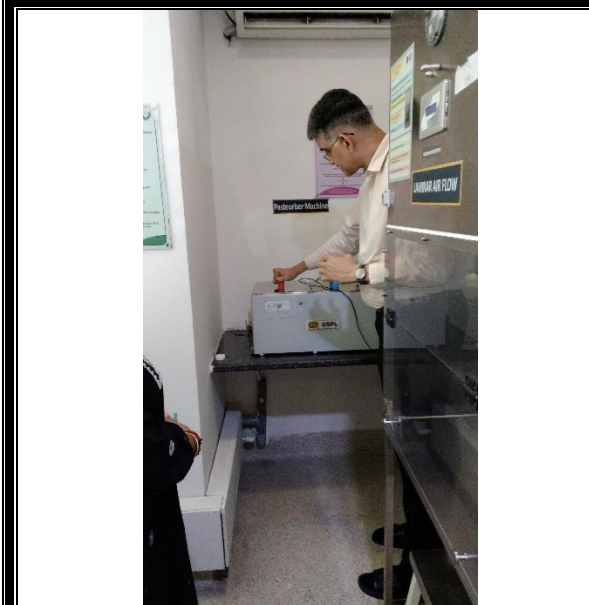
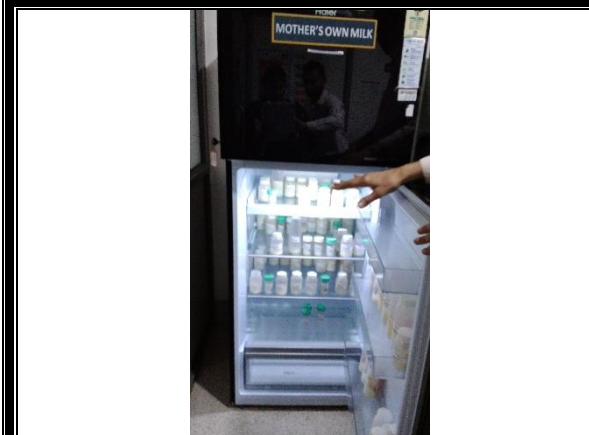
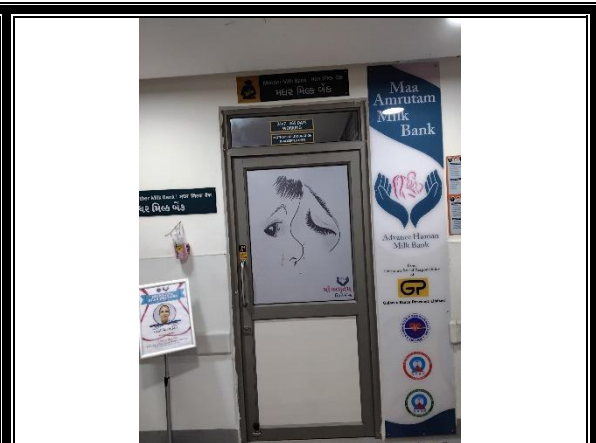


Annexure – 1

List of Equipments UNMICRC FY 2020-21



Equipments for Homograft Valve Bank



Equipments for Mother Milk Bank



Console for Ventricular Assist Device (VAD) system



Continuous Renal Replacement Therapy (CRRT) machine



High-End Motorized ICU Bed with Integrated Air Mattress for Heart-Lung Transplant patients



High-End Multifunctional Positioning bed for Early Mobilisation and ICU Rehabilitation



C-Arm Compatible Operation Theatre (OT) table



Mobile Extra-Corporeal Membrane Oxygenation (ECMO) System

Annexure – 2

Case Study 1

Patient Profile

Name: Mrs. Ramilaben Manubhai

Age: 53 years

Gender: Female

Residence: Ahmedabad, Gujarat

Successful Mitral Valve Replacement (MVR)

Background and Medical Condition

Mrs. Ramilaben Manubhai, a 53-year-old woman from Ahmedabad, was experiencing breathlessness during routine daily activities, which significantly affected her mobility and overall quality of life. Medical evaluation revealed a cardiac condition requiring Mitral Valve Replacement (MVR) to restore normal heart function.

Admission and Pre-operative Care

- Date of Admission (DOA): 8th December 2025

Upon admission, the hospital conducted detailed diagnostic investigations and provided thorough counselling to the patient regarding her condition and the proposed surgical intervention. The medical team explained the risks, recovery expectations, and post-operative care, ensuring the patient and her family were well-informed. The procedure was supported under the Ayushman Bharat scheme, enabling access to advanced cardiac care.

Surgical Intervention

- Procedure: Mitral Valve Replacement (MVR)
- Date of Surgery (DOS): 16th December 2025
- Operating Surgeon: Dr. Anil Jain

The surgery was successfully performed despite the complexity associated with the patient's age. The treating team anticipated a relatively challenging recovery phase due to age-related factors and overall physical condition.

Outcome and Patient Experience

Post-surgery, Mrs. Manubhai experienced significant improvement in breathing, indicating successful restoration of cardiac function. However, due to her age and physical condition, she continued to experience post-operative pain, which is being managed through appropriate medical care and follow-up. The medical team continues to monitor her recovery closely to ensure gradual improvement and comfort.

Impact and Conclusion

This case highlights the importance of timely cardiac intervention, even in older patients, to improve functional capacity and quality of life. Despite post-operative discomfort, the successful Mitral Valve Replacement has addressed the root cause of her symptoms and provided a pathway toward better health.



Case Study 2

Patient Profile

Name: Mrs. Ajal Babariya

Age: 38 years

Gender: Female

Residence: Surat, Gujarat

Management of Post-Surgical Complications Following Cardiac Surgery

Background and Medical Condition

Mrs. Ajal Babariya, a 38-year-old woman from Surat, had previously undergone Mitral Valve Replacement (MVR) along with Bypass Surgery approximately six months earlier. Although the initial surgery addressed her cardiac condition, she later developed infection at the surgical stitch site, which required further medical attention. In addition, the patient was found to have low blood pressure, adding complexity to her clinical condition.

Due to the persistence of these complications, she was re-admitted for evaluation and treatment. The patient was referred to the institute through a relative, Mr. Tarunbhai, an employee working in the OPD at U.N. Mehta Institute of Cardiology & Research Centre (UNMICRC).

Admission and Pre-operative Care

Following admission, the medical team conducted thorough clinical assessments to evaluate the infected stitches and her overall cardiac status. The patient and her family were counselled regarding the nature of the complication, the proposed course of treatment, and the recovery process. Special care was taken considering her low blood pressure and post-surgical vulnerability.

Surgical / Medical Intervention

- Procedure: Management of post-operative infection following MVR and Bypass Surgery
- Operating Surgeon: Dr. Jignesh Kothari

Dr. Jignesh Kothari and the treating team carefully managed the infected surgical site while ensuring stabilization of the patient's vital parameters. The intervention focused on controlling infection, preventing further complications, and supporting cardiac recovery.

Outcome and Patient Success

Following the intervention, Mrs. Babariya showed gradual improvement. The infection was brought under control, and her overall condition stabilized under close medical supervision. Despite the challenges posed by post-surgical infection and low blood pressure, timely medical intervention helped prevent further complications and supported her ongoing recovery.

Impact and Conclusion

This case highlights the importance of continuous follow-up and timely management of post-operative complications in cardiac surgery patients. Mrs. Ajal Babariya's case



demonstrates how specialized care, early intervention, and expert clinical management can lead to positive outcomes even in complex post-surgical scenarios. The coordinated efforts of the medical team ensured patient safety and improved recovery prospects.



Case Study 3

Interstate Case

Patient Profile

Name: Mrs. Avantika Mukesh

Age: 45 years

Gender: Female

Residence: Madhya Pradesh

Bypass and Valve Surgery Following Recurrent Cardiac Symptoms

Background and Medical Condition

Mrs. Avantika Mukesh, a 45-year-old woman from Madhya Pradesh, had a history of cardiac illness and had previously undergone a Balloon Mitral Valvotomy (BMV) procedure in 2023 due to cardiac blockage. Despite the earlier intervention, she later began experiencing persistent back and chest pain, indicating possible progression of her cardiac condition.

On the advice of a local doctor in Madhya Pradesh, she was referred to the U.N. Mehta Institute of Cardiology & Research Centre (UNMICRC) for advanced evaluation and specialized cardiac care.

Admission and Pre-operative Care

- Date of Admission (DOA): 6th December 2025

After admission, comprehensive diagnostic assessments were carried out to evaluate the cause of her recurring symptoms. The medical team provided detailed counseling regarding the findings and explained the need for further surgical intervention. The patient and her family were guided through the treatment plan, risks, and recovery expectations.

Surgical Intervention

- Procedure: Bypass Surgery along with Valve Surgery
- Date of Surgery (DOS): 20th December 2025
- Operating Surgeon: Dr. Pravin Nayak

Considering the patient's medical history and current condition, the treating team decided to perform bypass surgery along with valve surgery. The procedure was successfully carried out by Dr. Pravin Nayak and the cardiac surgery team.

Outcome and Patient Success

Following surgery, Mrs. Mukesh showed steady clinical improvement. Her chest and back pain reduced significantly, and her overall cardiac function stabilized. The successful intervention addressed the underlying cardiac issues that were not fully resolved by the earlier procedure, thereby improving her quality of life and reducing future health risks.

Impact and Conclusion



This case underscores the importance of specialized cardiac care and timely referral in managing complex heart conditions. Mrs. Avantika Mukesh's recovery demonstrates how advanced surgical intervention, combined with expert clinical management, can lead to successful outcomes even in patients with a prior history of cardiac procedures.



Annexure – 3

Case Study_Neonates

Case Study 1

Patient Name: Neamat Moin Vohra

Age: 10 months

Gender: Female

Location: Anand

Diagnosis: Ventricular Septal Defect (VSD)

Surgical Procedure: MVR (Mitral Valve Repair)

Operating Surgeon: Dr. Tushar Gajjar

Date of Admission (DOA): 10th June 2025

Date of Surgery (DOS): 14th June 2025

Paediatric Cardiac Surgery – Ventricular Septal Defect (VSD)

Background & Medical Condition

Neamat Moin Vohra, a 10-month-old infant, was diagnosed with a large Ventricular Septal Defect (approximately 10–12 mm)—a congenital condition characterized by a hole in the wall separating the heart's ventricles. Due to this defect, the child experienced frequent coughing, recurrent fever, and poor weight gain.

One of the major clinical challenges was the child's low and stagnant body weight, which had remained unchanged for nearly three consecutive months. This significantly delayed surgical intervention, as adequate weight and physical stability are critical prerequisites for paediatric cardiac surgery.

Intervention & Treatment

After continuous monitoring and stabilization, Neamat was admitted on 10th June 2025 for definitive management. Following thorough pre-operative evaluation and optimization, she successfully underwent Mitral Valve Repair (MVR) for VSD correction on 14th June 2025, performed by Dr. Tushar Gajjar, an experienced paediatric cardiac surgeon. The surgery was conducted without complications, and the child responded well during the immediate post-operative period.

Outcome & Impact

Post-surgery, Neamat showed significant clinical improvement. Her respiratory symptoms reduced markedly, episodes of fever subsided, and gradual improvement in feeding tolerance and overall activity was observed. The successful correction of the cardiac defect has placed her on a path toward normal growth and development, greatly improving her quality of life.



Conclusion

Neamat's case highlights the life-saving impact of early diagnosis, expert surgical care, and timely support through health programmes. Despite challenges related to low body weight and delayed operability, coordinated medical intervention ensured a positive outcome. Today, Neamat has a renewed chance at a healthy childhood—free from the limitations imposed by congenital heart disease.



Case Study 2

Highlights - Mother's Milk Bank Contribution

Patient Name: Bhuvnesh Sonar
Age: 1.5 years
Gender: Male
Location: Ahmedabad
Referral Source: School Health Programme
Diagnosis: Ventricular Septal Defect (VSD)
Current Status: Post VSD Closure (Routine Follow-up)
Date of Procedure: 15th March 2025
Paediatric Cardiac Care & Community Contribution

Background & Medical Condition

Bhuvnesh Sonar, a 1.5-year-old child, was diagnosed with a Ventricular Septal Defect (VSD)—a congenital heart condition characterized by an abnormal opening between the heart's ventricles. The condition required timely surgical intervention to prevent long-term complications and to support healthy growth and development.

The child successfully underwent VSD closure surgery on 15th March 2025. Following the procedure, he has been under regular medical supervision to monitor recovery and overall cardiac function.

Follow-up & Current Health Status

Bhuvnesh visited the hospital for a routine post-operative follow-up. Clinical evaluation indicated satisfactory recovery, with stable vital parameters and no immediate post-surgical complications. The child continues to progress well under standard pediatric cardiac care protocols.

Social Impact & Community Contribution

An inspiring aspect of this case is the mother's voluntary contribution to the Mother Milk Bank. After receiving complete information about the milk donation process and providing informed consent, she chose to donate her breast milk to support nutritionally vulnerable infants, including premature and critically ill babies.

This act of generosity not only contributes to saving lives but also reflects increased awareness and trust in institutional healthcare services.

Conclusion

Bhuvnesh's case demonstrates the dual impact of medical intervention and community engagement. While advanced paediatric cardiac care ensured the child's recovery and long-term well-being, the mother's decision to donate milk symbolizes how beneficiaries of healthcare systems often become contributors themselves.



Case Study 3

Patient Name: Gautamsinh Solanki

Age: 13 years

Gender: Male

Location: Kheda

Referral Source: School Health Programme

Diagnosis: Congenital Heart Defect (CHD) with Heart Blockage and Bradycardia (Low Heart Rate)

Referred From: Local Hospital

Adolescent Cardiac Care – Congenital Heart Defect (CHD)

Background & Medical Condition

Gautamsinh Solanki, a 13-year-old adolescent, presented with symptoms indicative of cardiac conduction abnormality, including heart blockage and persistently low heart rate (bradycardia). Initial evaluation was conducted at a local hospital, where an Electrocardiogram (ECG) was performed.

The ECG findings confirmed a Congenital Heart Defect (CHD) requiring advanced and specialized cardiac intervention, beyond the scope of the local healthcare facility.

Referral & Specialized Intervention

Based on the diagnostic findings, the patient was referred to U.N. Mehta Institute of Cardiology & Research Centre (UNMICRC) for further evaluation and management. The referral was facilitated through the School Health Programme, ensuring timely access to tertiary-level cardiac care.

At UNMICRC, the patient underwent comprehensive cardiac assessment to plan appropriate major treatment, as per clinical indications.

Outcome & Impact

Early identification and prompt referral played a critical role in preventing potential life-threatening complications. The structured referral pathway enabled the patient to access specialized pediatric cardiology services at a critical stage of growth and development.

Conclusion

Gautamsinh's case highlights the importance of early screening, effective referral systems, and access to specialized cardiac institutions. The coordination between local healthcare providers, the School Health Programme, and UNMICRC ensured that a serious congenital cardiac condition was identified and addressed in time.



Case Study 4

Patient Name: Kuldeep Gopal

Age: 15 years

Gender: Male

Location: Madhya Pradesh

Referral Source: School Health Programme (*Patient referred through a relative*)

Diagnosis: Atrial Septal Defect (ASD)

Procedure Performed: ASD Closure using Balloon Device

Adolescent Cardiac Intervention – Atrial Septal Defect (ASD)

Background & Medical Condition

Kuldeep Gopal, a 15-year-old adolescent from Madhya Pradesh, was diagnosed with a congenital heart defect in the form of an Atrial Septal Defect (ASD)—a condition characterized by a hole in the wall separating the heart's upper chambers.

The patient was advised further evaluation and treatment after being referred through a relative, which led him to seek specialized cardiac care.

Hospital Intervention

Following detailed diagnostic assessment, the patient underwent ASD closure using a balloon-based device, a minimally invasive cardiac procedure commonly adopted for suitable ASD cases. The procedure was performed successfully, avoiding the need for open-heart surgery.

The intervention was carried out under expert medical supervision, and the patient responded well during the post-procedure period.

Outcome & Impact

Post-intervention, the patient showed marked clinical improvement, with stabilization of cardiac function and relief from symptoms associated with the defect. The minimally invasive approach ensured shorter recovery time and reduced procedural risk, allowing the patient to resume normal activities gradually.

Conclusion

Kuldeep's case demonstrates the effectiveness of advanced interventional cardiology techniques in treating congenital heart defects in adolescents. It also highlights how awareness, timely referral—whether through formal channels or personal networks—and access to specialized hospitals can significantly improve health outcomes.



Annexure – 4

(Question Set)

CSR Impact Assessment Questionnaire

Financial Year: 2020–2021

Project: CSR Support for Strengthening Advanced Cardiac and Critical Care Infrastructure

Implementing Agency: U.N. Mehta Institute of Cardiology & Research Centre (UNMICRC)

CSR Partner: Gujarat State Petronet Limited (GSPL)

Assessment by: Gujarat Industrial and Technical Consultancy Organisation Ltd. (GITCO)

A. Institutional-Level Questionnaire

Objective: To evaluate institutional outcomes, operational efficiency, and project implementation.

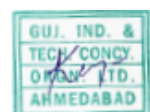
1. What were the key CSR-supported equipment and infrastructure components received?
2. How were these assets prioritized and selected?
3. What was the scale of institutional improvement?
4. What challenges were faced during implementation?
5. How were maintenance and utilization ensured?
6. Were any measurable impacts recorded?
7. What are the recommendations for future improvement?

B. Medical / Technical Staff Questionnaire

1. Which CSR-supported systems were used most frequently?
2. How did these systems enhance patient outcomes?
3. Were training sessions organized for staff operation and maintenance?
4. How did the intervention affect workload or efficiency in your department?
5. Were there any challenges in integrating new equipment with existing systems?

C. Beneficiary / Patient Questionnaire

1. Were patients aware that their treatment or services were supported under CSR initiatives?
2. Did patients experience improved access or affordability in services due to CSR-supported infrastructure?
3. Was direct patient interaction or feedback collection possible during assessment?
4. How would you describe overall patient satisfaction with the provided cardiac and critical care services?



D. CSR Partner / Project Management Questionnaire

1. Was the project aligned with GSPL's overall CSR focus and thematic areas?
2. How were project monitoring and evaluation carried out?
3. Were the results and outcomes satisfactory from the CSR partner's perspective?
4. What key challenges or limitations were noted during project execution or assessment?



Annexure – 5

(Answer Set)

CSR Impact Assessment – Responses

Financial Year: 2020–2021

Project: CSR Support for Strengthening Advanced Cardiac and Critical Care Infrastructure

Implementing Agency: U.N. Mehta Institute of Cardiology & Research Centre (UNMICRC)

CSR Partner: Gujarat State Petronet Limited (GSPL)

Assessment by: Gujarat Industrial and Technical Consultancy Organisation Ltd. (GITCO)

A. Institutional-Level Responses

1. **CSR-supported equipment and infrastructure components received:** Initial procurement included *ECMO Machines, High-End ICU Ventilators, Digital Radiography (DR) System*, and essential cardiac monitors.
2. **Asset prioritization and selection:** Assets were identified through UNMICRC's internal assessment of critical care needs, validated by GSPL under its healthcare CSR focus.
3. **Scale of institutional improvement:** Institutional critical care capacity increased by approximately 20%, improving ICU readiness and availability.
4. **Implementation challenges:** Procurement faced delays due to *import restrictions and COVID-19 supply chain disruptions*.
5. **Maintenance and utilization measures:** *Preventive maintenance protocols* were instituted by the biomedical engineering department, with periodic internal audits.
6. **Measurable impacts recorded:** Noticeable reduction in ICU turnaround time, improved ventilator access, and enhanced patient handling capacity during high-demand phases.
7. **Recommendations:**
Continuous skill enhancement, calibration training, and long-term maintenance planning.

B. Medical / Technical Staff Responses

1. **Frequently used CSR-supported systems:** *ECMO systems and ICU ventilators*, especially during pandemic peaks, were the most utilized.
2. **Enhancement in patient outcomes:** Provided *continuous cardiac and pulmonary support*, improving recovery rates and lowering mortality in critical cases.
3. **Training sessions organized:** Conducted *OEM-supported training* for perfusionists and ICU medical staff.
4. **Effect on workload and efficiency:** Reduced equipment bottlenecks, lowering strain on shared ICU resources and enabling faster patient turnover.
5. **Integration challenges:** Initial alignment with legacy systems required adjustments; later stabilized with operator proficiency.



C. Beneficiary / Patient Responses

1. **Awareness of CSR-supported services:** Most beneficiaries were unaware of the CSR source but benefited indirectly through government schemes.
2. **Access and affordability improvement:** Significantly reduced *out-of-pocket expenses* due to MA Yojana and Ayushman Bharat coverage.
3. **Patient interaction during assessment:** Limited due to data privacy and institutional confidentiality policies; indirect feedback collected from staff and coordinators.
4. **Overall patient satisfaction:** High satisfaction regarding *ICU care quality, availability of advanced equipment, and post-treatment monitoring.*

D. CSR Partner / Project Management Responses

1. **Alignment with CSR focus:** Fully aligned with GSPL's thematic area of *Healthcare Infrastructure and Accessibility.*
2. **Monitoring mechanisms:** Carried out through regular documentation, fund utilization reports, and periodic review meetings.
3. **Satisfaction with results:** Highly satisfactory; the intervention met its objectives of strengthening institutional response during a health crisis.
4. **Key challenges:** *Limited direct patient engagement* and data-sharing constraints restricted deeper beneficiary analysis.

Key Observations – FY 2020–2021

- Established a strong institutional base for advanced cardiac care expansion.
- Initial underutilization due to existing infrastructure overlap.
- Data privacy limited direct patient-level analysis.
- Full potential realized in the next financial year through cumulative equipment integration.

