REVIEW ARTICLE

A Narrative Review of Strengthening Cardiac Rehabilitation in India: Challenges and Opportunities

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Abstract

Cardiac rehabilitation (CR) is a critical component of secondary prevention in cardiovascular disease (CVD) management. In India, where CVD prevalence is rising rapidly, CR remains severely underutilized due to multiple systemic barriers. These include limited infrastructure, insufficient funding, low awareness, and inequitable access across urban and rural regions. This review assesses the current CR landscape in India, contrasts it with global benchmarks, and highlights key implementation gaps. It further explores scalable solutions such as telerehabilitation, community-based programs, and integrated multidisciplinary models. The paper emphasizes the need for robust policy frameworks, sustainable funding, infrastructure strengthening, and comprehensive workforce development. Achieving universal access to CR in India demands a multisectoral, collaborative approach involving government agencies, healthcare providers, academic institutions, nongovernmental organizations (NGOs), and private stakeholders. Enhancing CR services is not only a clinical necessity but also a national public health priority.

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Introduction

India is experiencing a sharp rise in cardiovascular disease (CVD), a major contributor to morbidity and mortality from noncommunicable diseases. Cardiac rehabilitation (CR), a multidisciplinary, evidence-based intervention, significantly improves survival, functional capacity, and quality of life following cardiac events. Despite its proven benefits and endorsement by international guidelines, CR remains inadequately implemented in India.[1] Several factors contribute to this gap—lack of awareness among patients and providers, inadequate funding, infrastructural deficits, and disparities in urban vs rural healthcare access. Out-of-pocket expenses further hinder CR utilization.[2] This paper examines the present challenges in CR adoption, compares India's performance with global trends, and presents pathways for expanding and institutionalizing CR nationwide.

The Unmet Need

Cardiovascular disease is the leading cause of death in low- and middle-income countries (LMICs), including India. India's public healthcare system operates through a three-tier structure comprising primary, secondary, and tertiary levels, as outlined by the Indian Public Health Standards (IPHS). National health programs are designed to be implemented across all these levels to ensure comprehensive and equitable healthcare delivery. Although CR is recommended as a class IA intervention, its availability remains limited. According to a global audit, India has a CR patient-to-spot ratio of 1:360, significantly lower than the Eastern Mediterranean (1:104), Southeast Asia (1:283), and Canada (1:24). India ranks second only to China in the scale of unmet CR needs, requiring over 3.3 million additional CR spots annually.[3] Financial barriers, particularly the lack of insurance coverage, further limit access and affordability. At the primary level, subcenters (SCs) serve as the initial point of contact, providing basic preventive and promotive services. These are supported by primary health centers (PHCs), which offer outpatient care, minor emergency treatment, and serve as referral units for SCs. Secondary care is delivered through community health centers (CHCs), subdistrict hospitals (SDHs), and district hospitals (DHs), offering more advanced diagnostic and inpatient services. Tertiary care is provided at medical colleges and super-specialty institutes, including national centers for rehabilitation. Rehabilitation services are integrated into several national programs. The National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke (NPCDCS) includes physiotherapy and counseling for risk factor management. Similarly, speech and audiology rehabilitation are provided under the National Program for Prevention and Control of Deafness (NPPCD), while medical rehabilitation is covered under the National Leprosy Eradication Programme.[4] Despite these provisions, specific and structured CR services are not prominently featured in the policies or implementation strategies, particularly at the primary and secondary levels.

Infrastructure data from Maharashtra shows a vast network of health facilities, including over 10,000 SCs and nearly 2,000 PHCs, supported by a physiotherapy workforce of around 3,190 professionals. However, even with this infrastructure, there is no clear policy framework or service protocol dedicated to CR across the levels of care.[5] A review of various ministry websites, national health portals, and geographically based data sources did not yield substantial evidence of dedicated CR programs. This reveals a critical gap in rehabilitative care for cardiac conditions, despite their inclusion under broader noncommunicable disease programs.[6] To bridge this gap, there is a need to institutionalize CR through clear guidelines, trained human resources, and integration into existing public health infrastructure at all levels.

Challenges in Implementing Cardiac Rehabilitation in India

Cardiac rehabilitation's widespread adoption in India remains limited due to several interrelated challenges. These include low awareness, inefficient referral systems, inadequate infrastructure, financial constraints, and disparities across healthcare levels and geographic regions.

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Awareness and Education Gaps

Awareness about CR is limited among both patients and healthcare professionals. Postevent cultural norms that discourage physical activity also reduce participation. CR is largely absent from medical and allied health curricula, leading to low referral rates. CR's role in long-term cardiovascular health is often overlooked. Misconceptions of viewing rest as the preferred mode of healing, and cultural stigma around illness, can discourage participation in CR.[7]

Unstructured Referral Systems

Referral systems play a critical role in ensuring patient access to CR. Cardiologists, often the first point of contact postcardiac events, may hesitate to refer patients due to limited CR training, lack of standardized referral protocols, and insufficient availability of dedicated CR centers.[8] Many physicians lack formal CR training or hesitate to refer due to the absence of standardized referral protocols and limited availability of CR centers.

Infrastructural Limitations

Rural and semi-urban areas often lack CR facilities, trained staff, and necessary equipment. Rehabilitative care is deprioritized compared to acute interventions. Acute-care services tend to be prioritized over preventive CR, resulting in underfunding and under-prioritization of long-term CR, contributing to poor outcomes.[9]

Financial Constraints

Cardiac rehabilitation in India is funded through a mix of government programs, private institutions, insurance, and out-of-pocket payments. The high cost of CR, combined with limited insurance coverage, deters patients, especially from lower socioeconomic strata.[10] With minimal insurance coverage, most patients bear the full cost of CR. Expansion of government schemes like Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PM-JAY) to include CR is essential.

Inequitable Access

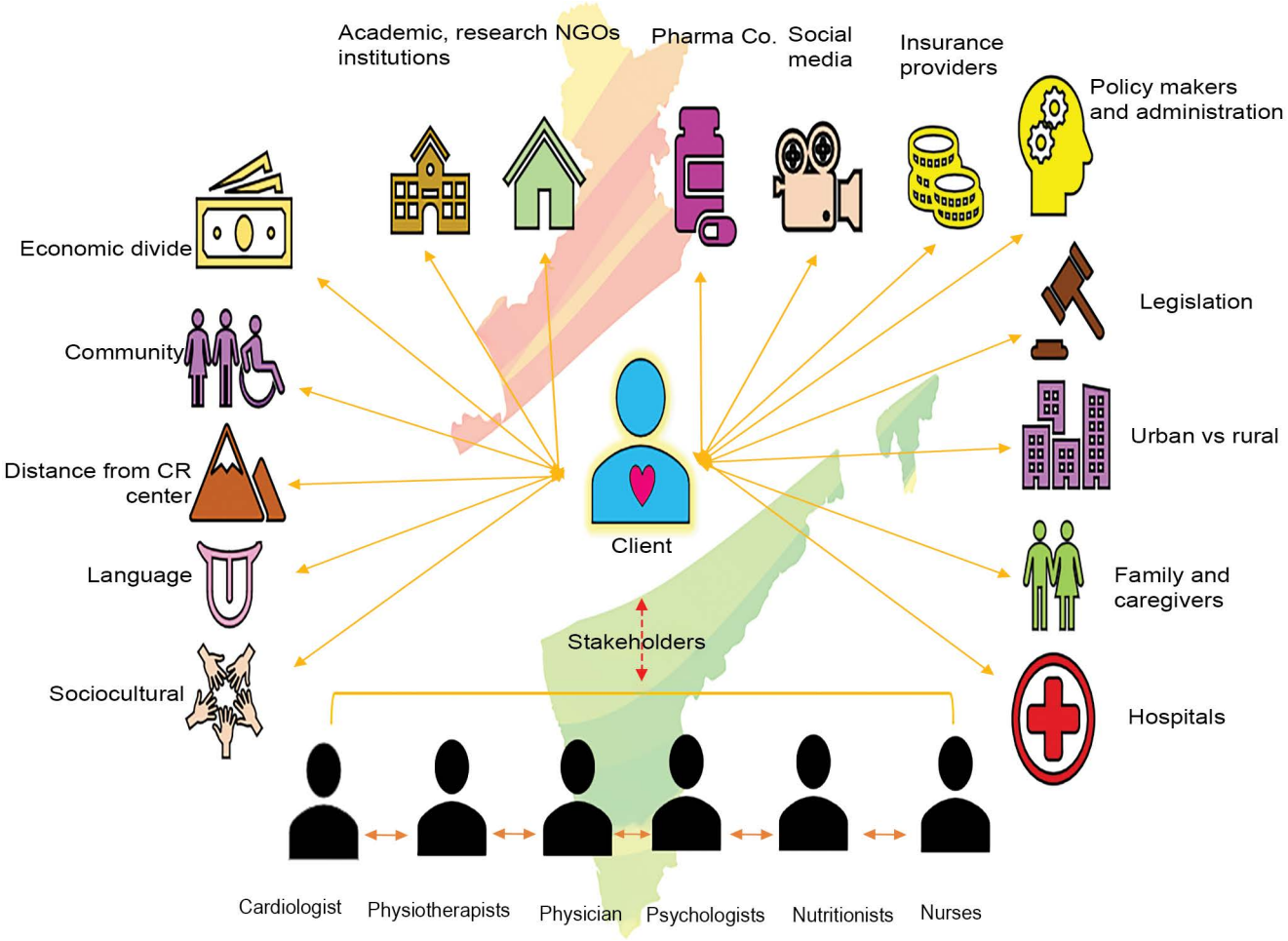
Cardiac rehabilitation services are concentrated in urban tertiary centers, leaving rural communities underserved. Fragmented care and lack of integration across health tiers affect continuity and outcomes.[11]

Opportunities and Innovative Approaches in Advancing Cardiac Rehabilitation in India

India has the potential to significantly improve its CR by adopting context-specific, innovative strategies and engaging a broad coalition of stakeholders (Fig. 1A). Digital technologies, telemedicine, community-based programs, and multidisciplinary approaches offer scalable and sustainable solutions to bridge gaps in access and quality of CR (Fig. 1B).

Digital Health and Telecardiac Rehabilitation

Emerging technologies such as mobile apps, wearable devices, and digital platforms offer patients personalized exercise plans, educational content, and real-time monitoring, empowering them to take an active role in recovery. Programs like Narayana Health's telecardiology and government initiatives such as "eSanjeevani" and "mHealth" exemplify use of telemedicine to overcome geographic barriers and improve adherence.[12] Integrating CR into



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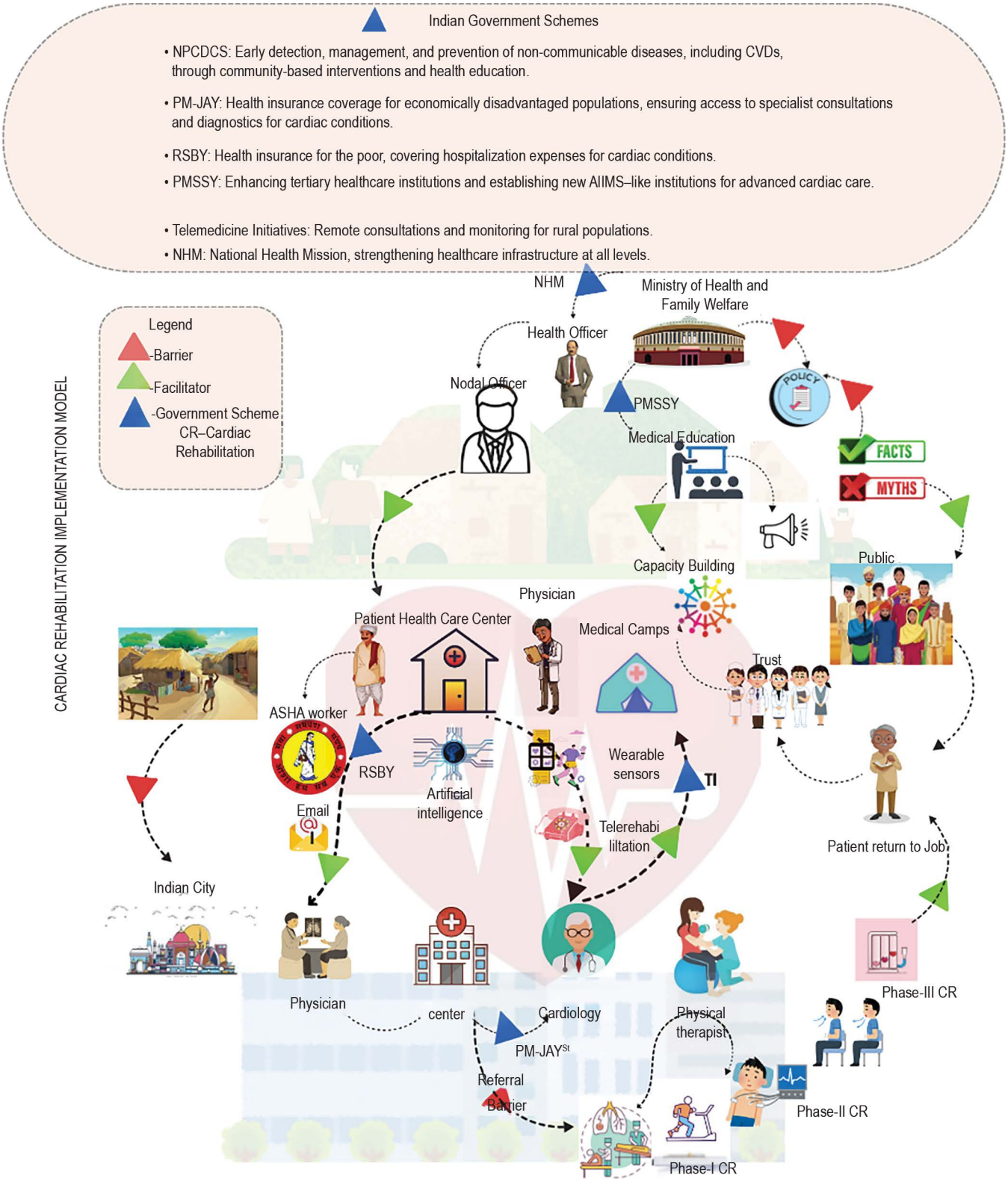

Figs 1A and B: (A) An illustration of stakeholders for the implementation of CR in India; and (B) CR implementation model

electronic health record (EHR) systems and adapting successful international models, such as Kaiser Permanente's referral protocol, can streamline care coordination. Continuing medical education sessions and workshops are essential to train healthcare providers in digital CR delivery for capacity-building. Stakeholders have distinct yet interdependent roles.[13]

Technology developers must create user-friendly, secure, and culturally sensitive platforms. Healthcare professionals should integrate digital tools into routine CR care and provide remote monitoring and support. Patients are encouraged to use these tools to manage their recovery and maintain communication with providers. Investments in digital infrastructure,

standardized guidelines, and pilot programs are needed to ensure safe and effective telerehabilitation. Wearable devices, remote monitoring systems, and data analytics should be leveraged to track progress and outcomes. Evidence from local studies is essential to validate these models and inform scale-up strategies.[14] Telerehabilitation using mobile apps, wearable technologies, and video consultations provides a scalable and cost-effective CR model. Initiatives like eSanjeevani and Narayana Health's telecardiology services show promise. Incorporating CR into EHRs and clinical pathways can streamline delivery and tracking.

Community- and Home-based Cardiac Rehabilitation

Community-based CR initiatives such as the yoga-based models and the Karnataka pilot led by Salim Yusuf highlight scalable, culturally relevant approaches to rehabilitation. Home-based CR has shown efficacy in improving exercise capacity and reducing hospital readmissions. Community health workers can play a pivotal role by raising awareness, providing support, and facilitating implementation. Training Accredited Social Health Activist (ASHA) workers in CR can extend outreach through screenings, education, and referrals. Providing culturally sensitive education, conducting home visits, and continuous patient monitoring enhances long-term adherence.[15] Localized models, including yoga-based and home-based CR, have shown efficacy. Training community health workers, such as ASHAs, to support basic CR can expand reach and improve adherence.

Multidisciplinary, Person-centered Models

Effective CR requires collaboration among cardiologists, physiotherapists, nurses, dietitians, and mental health professionals. Embedding CR training in medical and allied health education and developing national clinical guidelines can help standardize and elevate care quality.

Strengthening the Cardiac Rehabilitation Ecosystem: Policies, Financing, and Capacity Building

Sustainable Financing Models

Cardiac rehabilitation funding in India is fragmented, involving government support, private healthcare, insurance, and out-of-pocket payments. Private centers (e.g., Apollo Hospitals) fund CR through hospital revenue and corporate social responsibility (CSR) initiatives. CR inclusion under national health insurance schemes such as Ayushman Bharat PM-JAY is essential to lower costs and improve access. Innovative financing models like social impact bonds (SIB) and health savings accounts can diversify funding and promote sustainability. Kerala's health savings scheme and Rajasthan's SIB model offer replicable frameworks.[16] Institutionalizing CR within public and private insurance systems is critical. Innovative funding mechanisms, such as health savings accounts and SIB (piloted in Kerala and Rajasthan), can support scale-up.

Infrastructure and Workforce Development

Strengthening CR infrastructure and expanding training programs for CR professionals is essential. Regional centers of excellence can serve as hubs for training, service delivery, and research.[17]

Referral System Optimization and Public Engagement

Timely and systematic referral pathways are critical to CR utilization. Implementing clear referral protocols in cardiology and primary care settings, combined with EHR integration, will streamline patient transitions into CR. Community-based CR models, tailored to linguistic and cultural needs, are key to expanding access. Public awareness campaigns should highlight the benefits of CR, reduce stigma, and encourage participation. Integrating CR education into undergraduate and continuing medical education will improve healthcare providers' understanding and advocacy. India's CR services remain concentrated in metropolitan areas, leaving rural populations underserved. Geographic and socioeconomic disparity contributes to poor outcomes and necessitates targeted interventions.[18] Automating referrals through EHRs and increasing provider and public awareness *via* CME and health campaigns can boost participation.

National Integration

Cardiac rehabilitation is partially supported under programs like the NPCDCS, PM-JAY, and Pradhan Mantri Swasthya Suraksha Yojana (PMSSY). CR remains underutilized due to fragmented delivery and inconsistent integration. Policy advocacy plays a critical role in India. It is essential to allocate dedicated funding for CR under the National Health Mission (NHM) to ensure sustained program implementation. Inclusion of CR in the benefit packages of Ayushman Bharat PM-JAY can significantly improve affordability and access. Training ASHA workers in basic CR principles and referral pathways will enhance early identification and community-level support.[19] Furthermore, promoting CR through public–private partnerships and CSR initiatives, by actively involving nongovernmental organizations (NGOs) and community leaders, can help expand reach, reduce stigma, and ensure community engagement.

Cardiac rehabilitation programs are relatively cost-effective, but they are generally not covered under standard insurance schemes in India. Some private insurance policies may offer partial coverage for CR services, but such policies are limited and not widely adopted. Policy reforms to include CR under health insurance like PM-JAY can lower costs. Incorporating CR into PM-JAY ensures patients access essential services without high costs.

The NPCDCS emphasizes early detection through community-based interventions. Rashtriya Swasthya Bima Yojana (RSBY) offers insurance to the underprivileged. DHs, specialist consultations, and diagnostics are backed by PM-JAY, providing insurance coverage to the underprivileged with tertiary setups. PMSSY upgrades institutions like the All India Institute of Medical Sciences (AIIMS) and establishes state-of-the-art institutions. NHM initiatives focus on strengthening tertiary care CR. India has 1,55,000 SCs, 25,000 primary centers, 5,000 community centers, and 700 DHs. CR availability is limited but growing, with 3,000 physiotherapists (primary), 10,000 (secondary), and 5,000 (tertiary) healthcare setups across India.[20] Training ASHA workers in CR can enhance outreach by steering screenings, preliminary CR guidance, and referral.

Policy Advocacy for Cardiac Rehabilitation in India

Innovative financing models like SIB or health savings schemes could provide funding avenues for CR. NPCDCS establishes funding for CVD prevention and rehabilitation in PM-JAY. Health savings schemes in Kerala are an example where individuals are encouraged to save in savings accounts for health expenses, including CR, which allow patients to allocate pretax income for the middle-income bracket. SIBs were introduced in Rajasthan to fund private health investment in public health programs, with returns based on achieving specific health outcomes.[21] Advocacy can result in increased government and private sector funding for enhancing CR infrastructure, training professionals, and developing models to ensure quality.

Conclusion and Call to Action

Expanding CR access in India requires an integrated, multisectoral approach encompassing legislation, sustainable financing, infrastructure investment, digital innovation, and workforce development. Collaboration among government bodies, healthcare providers, NGOs, academic institutions, and private players is essential to achieve equitable access and quality care. Aligning national efforts with global frameworks like the WHO Rehabilitation 2030 initiative can offer a structured and effective pathway.[22] Strengthening CR is vital not only for improved individual health outcomes but also for addressing the broader CVD burden in India.

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