A Qualitative Study on the Current Status and Barriers of Integrated Medical-Preventive Services for Chronic Diseases Delivered by Family Doctor Teams: Postprint

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Abstract

Background Integration of treatment and prevention is a crucial initiative for implementing the Healthy China Strategy, which should be strengthened at the primary care level with family doctor teams as the vehicle and chronic disease management as the entry point.

Objective To investigate the current status of chronic disease integration of treatment and prevention services delivered by family doctor teams in urban Beijing and the barriers encountered during implementation, thereby providing evidence for promoting sustainable development of primary care integration of treatment and prevention.

Methods From December 2023 to February 2024, 20 family doctor team members and institution managers engaged in chronic disease integration of treatment and prevention were selected from 12 primary care institutions in urban Beijing using purposive sampling. Semi-structured interviews were conducted regarding service content, division of labor, resource allocation, and existing challenges. Thematic analysis was employed to analyze and synthesize the interview data.

Results The qualitative study identified 4 themes and 14 sub-themes. Regarding the service operation model, although primary care institutions in urban Beijing have explored diverse service approaches for the entire community population to facilitate chronic disease integration of treatment and prevention, the current service providers remain primarily general practitioners and community nurses, continuing the core of conventional chronic disease management. Service content requires innovation, and the pre-diagnosis, intra-diagnosis, and post-diagnosis service workflow needs broader implementation. Regarding the

service operation environment, challenges include insufficient family doctor team staffing, heavy workload, assessment and evaluation emphasizing “quantity” over “quality”, information silos, lack of top-level design, and absence of dedicated funding mechanisms. Additionally, the phenomenon of “separation of treatment and prevention” is prominent, manifested as dual management systems, disconnected service providers, and geographically dispersed medical and preventive work.

Conclusion Resource allocation for primary care integration of treatment and prevention services is inadequate, and the service operation model requires optimization. Strengthening personnel training, enhancing medical insurance support, accelerating regional information interoperability, and improving assessment and evaluation mechanisms are needed. Simultaneously, top-level design must be reinforced, service pathways clarified, and community functions implemented to develop a replicable and scalable chronic disease integration of treatment and prevention service model with multi-stakeholder participation from health administrative departments, communities, hospitals, and patients.

Full Text

Current Situation and Obstacles of Integrated Services for Chronic Diseases Provided by Family Doctor Teams: A Qualitative Study

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Abstract

Background The integration of medical care and prevention is an important measure for implementing the Healthy China Strategy. Family doctor teams as the mainstay and chronic disease management as the entry point are critical tools for implementing medical-preventive integration in primary health institutions.

Objective To understand the current situation and obstacles of medical-preventive integration in chronic disease management in Beijing’s urban areas, and to provide evidence for decision-making on sustainable development of integrated services.

Methods From December 2023 to February 2024, purposive sampling was used to recruit 20 participants, including family doctor team members and primary

care managers working on medical-preventive integration and chronic disease management in 12 primary health institutions in Beijing's urban area. Semi-structured interviews were conducted focusing on service content, division of labor, resource allocation, and existing problems. Thematic analysis was used to analyze and synthesize the interview data.

Results The qualitative research identified 4 themes and 14 sub-themes. Regarding service operation models, although primary health institutions had explored various service modalities to promote medical-preventive integration for chronic diseases, the main service providers remained general practitioners and community nurses, continuing the core of chronic disease management services. Service content needed innovation, and the pre-consultation, during-consultation, and post-consultation service process required broader implementation. Regarding the service operation environment, problems included insufficient family doctor team members, heavy workload, assessment emphasizing "quantity" over "quality," "information silos," lack of top-level design, and absence of special funding mechanisms. The phenomenon of "medical-prevention fragmentation" was evident, manifested as "two lines" in management systems, "two disconnections" between service providers, and dispersed work areas.

Conclusion Primary medical-preventive integration services suffer from insufficient resource allocation and require optimization of operation models. It is necessary to strengthen talent training, reinforce medical insurance support, accelerate regional information sharing, and improve assessment and evaluation mechanisms. Additionally, top-level design should be strengthened, service pathways clarified, community functions implemented, and a replicable, scalable chronic disease medical-preventive integration service model formed with participation from health administrative departments, communities, hospitals, and patients.

Keywords Treatment-prevention integration; Chronic disease; Family doctor services; Community health services; Qualitative research

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1.2 Data Collection

Based on preliminary research, a semi-structured interview guide was developed (Table 1). Data were collected through individual in-depth interviews conducted via a combination of online and offline methods. Two research team members with extensive epidemiological survey experience conducted one-on-one semi-structured interviews according to the predetermined guide. With participants' consent, all interviews were audio-recorded. Interviewers adjusted question sequences as appropriate and asked follow-up questions when needed, with each interview lasting 0.5-1 hour.

1.3 Data Analysis

Interview recordings were transcribed verbatim within 24 hours of completion. Thematic analysis was employed to organize, code, and synthesize the qualitative data using Nvivo12 software. The process involved: (1) researchers repeatedly reading the transcripts to develop initial open codes; (2) comparing and categorizing initial codes to form themes and sub-themes; and (3) team members discussing the preliminary themes to define and name them clearly.

2.1 Respondent Characteristics

From December 2023 to February 2024, purposive sampling was used to select family doctor team members and managers from 12 primary health institutions in Beijing's urban area. Sample size was determined by information saturation criteria. Since the focus of medical-preventive integration work is chronic disease management, with general practitioners and nurses as the main implementers, this study included general practitioners and community nurses as family doctor team members. Inclusion criteria for team members were: (1) currently engaged in family doctor team work for $ $5 years; (2) strong comprehension and expression abilities; and (3) voluntary participation. Inclusion criteria for institutional managers were: (1) heads of primary health institutions; (2) extensive primary care management experience with strong comprehension and expression abilities; and (3) voluntary participation. This study was approved by the Ethics Committee of the School of General Practice and Continuing Education, Capital Medical University (Approval No.: Z2024SY026), and all participants signed informed consent forms.

A total of 20 participants were interviewed, including 11 general practitioners (coded G1-G11), 5 community nurses (coded N1-N5), and 4 institutional managers (coded M1-M4). Participants ranged from 37-55 years old, with a mean age of $(45.2\$\pm5.7) years and average primary care work experience of (14.7\pm\$6.7)$ years (Table 2).

2.2 Connotation of Medical-Prevention Integration

As service providers, participants viewed service integration as the core connotation of medical-preventive integration. From a clinical perspective, this means integrating general medical services with public health services, incorporating preventive measures into daily clinical practice. From a chronic disease management perspective, it involves integrating preventive services such as follow-up visits and health education into outpatient care. As one general practitioner explained: "From a primary care perspective, medical-preventive integration means general practitioners incorporate prevention into daily diagnosis and treatment, integrating individual health into population disease prevention and control." Another noted: "Medical-preventive integration involves integrating prevention work throughout the entire process of general practitioners' daily clinical practice, such as providing tertiary prevention services for chronic dis-

ease patients." A manager described it as: "Implementing preventive measures directly during the consultation and medication collection process, completing face-to-face follow-up management and annual free physical examinations according to basic public health service requirements."

2.3 Service Operation Models

(1) Service providers remain primarily general practitioners and nurses. Family doctor team configurations in Beijing's urban areas mainly include "doctor-nurse-prevention" models, "doctor-nurse" binding models, and doctor-nurse-assistant (pharmacist) responsibility models. However, the actual providers of chronic disease medical-preventive integration services were basically general practitioners and community nurses. As one general practitioner stated: "Our community provides services through one-on-one doctor-nurse binding. The general practitioner is responsible for overall work with contracted chronic disease patients, while the community nurse assists with completing health records and follow-up records." Another explained: "The core members of family doctor teams are general practitioners, nurses, and preventive care personnel, but hypertension and diabetes management is mainly coordinated by general practitioners with nurse cooperation." A nurse confirmed: "In the daily provision of chronic disease medical-preventive integration services, most work is coordinated by general practitioners with nurse assistance, while other team members play minimal roles."

(2) Continuing the core of chronic disease management services, with content needing innovation. Primary health institutions started with contracted family doctor services to provide combined medical and preventive interventions for hypertension and diabetes patients. However, service content continued to focus on the two-disease management in the national basic public health service program, urgently needing to expand chronic disease management types and innovate service content. One general practitioner noted: "The actual work core of medical-prevention integration services overlaps with family doctor contracted services, manifested as comprehensive management of contracted chronic disease patients." Another stated: "Medical-prevention integration is reflected in daily outpatient services. In addition to medical services, we provide personalized health guidance and quarterly follow-up and other preventive services for hypertension and diabetes patients." A manager added: "Using the network and functions of public health services, medical-prevention integration is best implemented in hypertension and diabetes management."

(3) Full-process pre-consultation, during-consultation, and post-consultation services need promotion. Some communities in Beijing's urban areas have explored standardized medical-preventive integration service processes based on chronic disease management practices, gradually forming "pre-consultation, during-consultation, and post-consultation" full-process services through team collaboration. Typically, team nurses and family doctor assistants implement pre-consultation screening, general practitioners provide

daily diagnosis and prevention during consultation, and team nurses provide follow-up after consultation. However, limited by primary care hardware configuration and team member numbers, this has not been widely implemented in practice. One general practitioner explained: "No standardized service process has been formed. Mainly, general practitioners see patients alone, assess physical conditions, and follow up on medication use." Another described: "Pre-consultation (nurses) complete chronic disease screening in health huts, such as monitoring blood pressure and heart rate. During consultation, general practitioners conduct diagnosis and face-to-face follow-up in consultation rooms. Post-consultation (nurses) complete telephone follow-up." A manager noted: "When chronic disease patients visit the community, we provide pre-consultation screening and regular physical examination services. During diagnosis and treatment, we conduct disease stratification and staging management. Health education is provided after consultation."

(4) Diversified service modalities. Based on traditional diagnosis and treatment models, information technology has enabled chronic disease medical-preventive integration, forming a multi-channel development trend oriented toward directed triage as the main method, supplemented by home visits, internet medical care, and collaborative care services. One manager explained: "If chronic disease patients contract with family doctors, each time they register and visit the community, the registration system will direct them to their contracted general practitioner, forming relatively fixed continuous management." A general practitioner described: "For chronic disease patients with return visits, we provide internet medical services, with general practitioners offering health consultation and offline quick medication collection services." Another noted: "We establish family beds, with family doctor teams providing home medical services. General practitioners conduct preliminary condition assessment, and nurses implement corresponding nursing measures." One participant mentioned: "We have established an O+O (offline+online) diabetes collaborative care clinic, using internet and information technology advantages to extend services from outpatient to outside the hospital through App-based chat interactions between doctors and patients."

(5) Services target entire community population, but demand-side participation awareness is weak. Chronic disease medical-preventive integration services in Beijing's urban areas target the entire community population for hierarchical and categorical management, including healthy populations, high-risk populations, and chronic disease patients. However, in practice, service recipients have weak autonomous participation awareness and insufficient health demand, hindering comprehensive service implementation. One general practitioner noted: "We adopt different health education strategies for healthy, high-risk, and patient populations to provide more preventive services. But in actual work, chronic disease patients come to the community only for medication collection without other health needs." Another stated: "Most residents passively accept family doctor services, with very low self-management ability and demand for actively obtaining medical-preventive integration services." A

manager added: "Chronic disease medical-preventive integration services target healthy, high-risk, and patient populations, but patient participation willingness is low, with very few attendees at each health education lecture."

2.4 Service Operation Environment

(1) Insufficient family doctor team members and urgent need for service quality improvement. Despite national efforts to enrich the general practitioner workforce through standardized training, job transfer training, and other talent development systems, and measures for multi-site practice of general practitioners, the number of primary care general practitioners still cannot meet health service demands. Shortage of personnel and heavy per capita workload have become obstacles to providing high-quality medical-preventive integration services. One general practitioner explained: "General practitioners are limited, but the required number of contracted patients is large, resulting in heavy workload. The average consultation time per patient is only 2-3 minutes, leaving no energy to conduct chronic disease medical-preventive integration services." Another noted: "Insufficient human resources and large per capita workload result in general practitioners seeing an average of 100 patients daily, with very short communication time and no time for in-depth follow-up." A manager stated: "The average family doctor team contracts 2,000 residents. Primary care currently has low attractiveness for general practitioners, and centers face recruitment difficulties, leading to general practitioner shortages and huge workloads."

(2) Assessment emphasizes "quantity" over "quality," lacking special assessment schemes. Primary health institutions in Beijing's urban areas have not yet formed performance assessment and evaluation schemes specifically for chronic disease medical-preventive integration services. They still use quantitative evaluation methods for family doctor contracting and chronic disease management, emphasizing "quantity" over "quality," which needs improvement. One general practitioner explained: "The assessment mechanism focuses on workload indicators such as contracting numbers and chronic disease management quantities. Quality assessment uses sampling methods, checking 10 out of thousands of records for telephone follow-up satisfaction and disease control, with questionable effectiveness." Another noted: "Assessment of chronic disease medical-preventive integration services mainly reflects indicators such as chronic disease management rates, compliance rates, and health education frequency, basically covering medical service workload." A manager stated: "Our community focuses on workload assessment, requiring family doctor teams to complete specified follow-up workload. Second, we assess the standardization of chronic disease management, such as checking return visit rates and consultation frequencies above 3 times."

(3) Information sharing within institutions but "information silos" between institutions. Primary health institutions in Beijing's urban areas are equipped with chronic disease management information platforms encom-

passing both diagnosis and treatment and health records modules. As basic modules for "medical" and "preventive" services, they enable information sharing among core team members within family doctor teams. However, information interconnection has not been achieved between different primary health institutions or between primary institutions and higher-level hospitals, creating "information silos." One general practitioner explained: "Beijing communities use information management platforms purchased uniformly by health administrative departments, enabling internal information sharing. But each family doctor hospital network is different and cannot interconnect." Another noted: "Information systems between regions are not interconnected. Residents can use medical insurance cards to contract with multiple communities, creating duplicate records." A manager stated: "Primary medical and public health information systems are interconnected, such as automatically importing entered blood pressure values or chronic disease integrated management platform data into the public health system. However, higher-level hospitals and CDC information platforms are not interconnected with primary information systems."

(4) Medical alliance construction steadily advancing, but disease prevention and control mechanisms need improvement. Medical resources within the region have been integrated between higher-level hospitals and community health service institutions to build medical alliances, which have opened referral channels and provided technical guidance to primary care. However, disease prevention and control institutions have not yet been included in medical alliances, resulting only in unidirectional task assignments to community health service institutions, and the vertical linkage mechanism needs improvement. One manager explained: "Cooperation between communities and disease prevention and control institutions manifests as top-down unidirectional task assignments, such as conducting community diagnoses and establishing chronic disease health management groups." Another noted: "Communities and higher-level hospitals form close cooperation through medical alliances. From top to bottom, communities receive training and specialized outpatient support. From bottom to top, referral channels are opened. The CDC is more like an administrative agency, only assigning vaccination tasks to communities, without playing a role in population-based chronic disease health management." A third manager stated: "Primary care and higher-level hospitals form close and regional medical alliances, with higher-level hospitals providing technical support. CDC guidance to communities is mainly in preventive care, with little relationship with primary medical service institutions in chronic disease management."

(5) Insufficient top-level design for implementation pathways, urgently needing strengthened connotation construction. The practical pathway for chronic disease medical-preventive integration services in Beijing's urban areas still lacks top-level design. Currently, institutions are in the stage of autonomous learning about medical-preventive integration policies, with how to implement and promote integration still needing discussion and service connotation construction urgently requiring strengthening. One general practitioner noted: "Since 2019, we have learned about medical-preventive integra-

tion through academic conferences, policy documents, and continuing education training." A manager explained: "We regularly organize medical, nursing, and preventive personnel to learn medical-preventive integration policies and conduct related training, such as the 2030 Healthy China Plan Outline and Beijing medical-preventive integration job training." Another manager described: "We adopt a general-specialty combined training model, based on general practice appropriate technology training, with in-depth further study in interested specialized directions, and cultivating general practitioners' medical-preventive integration concepts for holistic services." However, one nurse stated: "Leaders mention the term medical-preventive integration in meetings, but we haven't received related training."

(6) Insufficient medical insurance support, lacking special funding mechanisms. There is still no special funding mechanism specifically for chronic disease medical-preventive integration services. Medical insurance support tends to favor medical services, lacking guidance for preventive service provision. Currently, only family doctor contracting service fees incentivize family doctor teams to provide chronic disease medical-preventive integration services, resulting in low service enthusiasm. One general practitioner explained: "Regarding chronic disease medical-preventive integration service fees, there are only family doctor contracting service fees, with no other funding or policy support." Another noted: "In our current policy system, more examinations and treatments generate more income, while prevention shows no short-term benefits and cannot motivate medical staff. We need policy inclination and guidance from medical insurance and related policies." A manager stated: "Beijing medical insurance reimbursement only targets diseases and other medical conditions, with no corresponding funding for prevention. Medical insurance support for preventive services is only reflected in family doctor contracting service fees, with medical insurance paying 30 yuan, financial subsidies of 40 yuan, and individual out-of-pocket payment of 30 yuan." Another manager added: "There is no special funding mechanism in chronic disease medical-preventive integration services, mainly relying on family doctor contracting service fees to promote medical-preventive integration."

2.5 "Medical-Prevention Fragmentation" Phenomenon

(1) "Two lines" in medical-prevention management systems. From a system construction perspective, disease prevention and control centers and health commissions are respectively responsible for preventive care and medical work. This "dual jurisdiction" leads to non-unified management systems, with significant differences in work content between medical/nursing and preventive care personnel. One general practitioner noted: "The preventive care department has specialized departments for work assignments. In actual family doctor team work, preventive care personnel and general practitioners are somewhat disconnected." A nurse explained: "The preventive care department in primary health institutions is managed by the regional CDC, while general practitioners

and nurses are directly under the community health service center, with different task assignments, making it difficult to integrate into the same team work." Another nurse stated: "Family doctor studios and preventive care departments belong to two different departments with different tasks assigned by higher authorities, making true medical-preventive integration somewhat difficult." A manager added: "Currently management is dispersed. Health commissions assign chronic disease management tasks to primary care, while CDCs assign vaccination and health education tasks to preventive care departments."

(2) "Two disconnections" between medical-prevention service providers. The original intention of incorporating preventive care personnel into family doctor teams was to have professionally trained prevention talent organize and implement health promotion under the holistic health concept. However, in actual chronic disease medical-preventive integration work, general practitioners and nurses are the implementation subjects, while preventive care personnel are mainly responsible for other national basic public health programs such as vaccination and maternal-child health care. Their work scopes basically have no intersection, making effective connection of chronic disease medical-preventive work impossible. One general practitioner explained: "Although preventive care personnel are included in family doctor team management, chronic disease medical-preventive integration services are basically provided by general practitioners and nurses. Preventive care personnel are only responsible for vaccination, making 'medical' and 'preventive' completely fragmented or piecemeal." Another noted: "Preventive care personnel are disconnected from family doctor teams. General practitioners undertake most public health work, while preventive care personnel do not truly participate in chronic disease management." A third general practitioner stated: "Preventive care personnel are responsible for vaccination and maternal-child health care, with heavy and independent workloads, but low integration with family doctor teams, not participating in detailed team work." Another explained: "Including preventive care doctors in family doctor teams has no practical effect. Medical and preventive care work are still conducted separately."

(3) Dispersed medical-prevention work areas. General practice diagnosis and treatment areas, physical examination areas, chronic disease management areas, and preventive care departments are not integrated into the same functional area, and connections between different office areas are weak, hindering the creation of one-stop medical-preventive integration services. One general practitioner noted: "Medical, nursing, and preventive care are partially disconnected. Doctors, nurses, and preventive care personnel in the same family doctor team are not in the same office area. Patients need to go to health huts for physical examination, general practitioner consultation rooms for diagnosis, chronic disease management areas for nurse follow-up, and preventive care departments for vaccination." A nurse explained: "Community center nurse work areas and general practitioner work areas are not on the same floor, completely failing to reflect being members of the same family doctor team." Another nurse stated: "General practitioner consultation rooms and nurse work areas are on the same

floor and close in location, but due to the small size of general practitioner consultation rooms, they are not in the same office."

3.2 Optimize Funding Mechanism and Strengthen Medical Insurance Support

Beijing has not yet introduced special subsidy policies or charging standards for medical-preventive integration services, and current medical insurance payment policies still focus on "protecting diseases." Drawing on international experience, developing medical insurance subsidy policies covering preventive services can help improve preventive service utilization rates. Primary medical-preventive integration should aim to "protect health," increasing public health service funds and medical insurance investment in preventive services, enriching service content and types, and thereby stimulating chronic disease patients' demand for medical-preventive integration services.

3.3 Clarify Community Responsibilities and Advocate Patient Participation

The implementation subjects of medical-preventive integration are general practitioners and nurses, while streets/communities have not implemented corresponding collaborative management responsibilities. Coupled with weak autonomous participation awareness among service recipients, a multi-stakeholder health management model needs to be constructed. According to WHO research reports and international experience, building a prevention-oriented integrated chronic disease health management model requires integrating community resources and strengthening community and patient participation. From the perspective of the Healthy China Strategy, health administrative departments should take the lead in linking medical-preventive integration assessment indicators with healthy community construction, clarifying the main responsibility scope of communities, enabling streets/communities to have motivation and willingness to become media for health education and promotion, organizing and coordinating community resources, actively promoting chronic disease medical-preventive integration, advocating patient autonomous participation, and improving their health behaviors.

3.4 Strengthen Top-Level Design and Clarify Service Pathways

Chronic disease medical-preventive integration services in Beijing's urban areas highly overlap with hypertension and diabetes management service content. Interview results also reflect that chronic disease management is currently the main form of medical-preventive integration service provision, with service content needing innovation. Although multiple experts participated in releasing the "Innovate Medical-Preventive Integration, Build Healthy China Together" Online Expert Consensus, which has guiding significance for implementing medical-preventive integration services in primary care, specific implementation pathways for chronic disease medical-preventive integration have not been clarified.

It is necessary to combine previous chronic disease management practical experience, with health administrative departments leading top-level design for medical-preventive integration, strengthening connotation construction, establishing replicable and scalable primary chronic disease medical-preventive integration service standards and content, clarifying service implementation pathways, and refining service implementation details.

3.5 Accelerate Information Construction and Promote Regional Information Interconnection

In the current primary health institution operation environment, "information silos" remain a significant problem constraining medical-preventive integration work. It is necessary to accelerate information construction, relying on regional information platforms to connect electronic medical records and resident health record systems across medical institutions within the region, achieving information interconnection between primary health service institutions, disease prevention and control institutions, and higher-level hospitals. Mobile medical devices should be promoted to collect patients' home health information in real-time, breaking down doctor-patient information communication barriers and extending services from in-hospital to out-of-hospital, achieving co-management by doctors and patients.

3.6 Improve Quality Evaluation System and Perfect Incentive Mechanism

The current assessment and evaluation system focuses on hypertension and diabetes health management as core indicators, emphasizing management quantity assessment, while quality assessment only involves outcome indicators such as control rates and compliance rates. It is necessary to aim for quality improvement, perfect process indicators in chronic disease medical-preventive integration services, establish effective assessment and evaluation feedback mechanisms, and form a standardized assessment indicator system that comprehensively evaluates both medical and preventive work and emphasizes both management quantity and quality. Second, service item charging standards can be formulated based on clarified chronic disease medical-preventive integration service content, linking family doctor team members' performance-based salaries to assessment results to motivate their initiative in providing services.

3.7 Optimize Outpatient Layout and Connect Medical-Preventive Services

Dispersed medical-preventive office areas are hardware obstacles to providing integrated medical-preventive integration services. Therefore, it is urgent to construct integrated chronic disease medical-preventive integration clinic areas, integrating doctors, nurses, and preventive care personnel from the same family doctor team into the same functional area, and increasing connectivity between different office areas such as health huts, chronic disease management areas,

and general practitioner consultation rooms to create one-stop medical functional areas. According to medical-preventive service processes, pre-consultation service areas, during-consultation service areas, and post-consultation service areas should be sequentially divided to meet patients' complete service needs for directed triage, follow-up, medical consultation, medication collection, post-consultation health guidance, and appointment booking within one functional area, improving the patient experience.

Primary health institutions are the "main battlefield" for chronic disease medical-preventive integration service practice, and their service operation models will directly affect the future promotion trend of medical-preventive integration in China. To further improve chronic disease medical-preventive integration service levels, it is necessary to promptly enhance primary medical-preventive integration service supply capacity, strengthen family doctor team construction, optimize team structure, enhance medical insurance payment support, unify service standards and content, establish effective assessment and evaluation mechanisms, perfect incentive systems, improve primary outpatient equipment conditions, and effectively empower primary chronic disease medical-preventive integration work through information construction.

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Note: Figure translations are in progress. See original paper for figures.