2025 » 2029

The 5th Five-Year Strategic Plan For the Fight Against Diabetes

Contents

I. Foreword

The Japan Diabetes Society (JDS) – General Version of the 5th Five-Year Strategic Plan for Diabetes

Diabetes is no longer merely a matter of individual health management—it has become a pressing societal issue that demands coordinated action across all levels of healthcare, policy, and community engagement.

In Japan alone, more than 11.5 million people live with diabetes, and over 20 million are affected when including those at risk. As the population continues to age, these numbers are expected to rise, placing increasing strain on healthcare systems, social welfare, and community infrastructure.

To avert further stress on these essential systems, it is imperative to implement proactive, integrated strategies without delay.

This General Version of the 5th Five-Year Strategic Plan for Diabetes outlines JDS's vision and direction for addressing this evolving challenge.

Grounded in the latest scientific discoveries and clinical advances, the plan seeks to strengthen cross-disciplinary and cross-sectoral collaboration in order to protect and enhance the health and well-being of people with diabetes.

Advancing to the Next Stage of Diabetes Care

Building on the foundation of previous strategic plans, this 5th iteration sets forth a forward-looking agenda focused on the following key priorities:

- **Implementing precision diabetes care through scientific innovation and clinical integration**
- **Accelerating research and advancing therapeutic breakthroughs**
- **Promoting diabetes prevention and management as a shared responsibility across society**
- **Leveraging digital technologies to transform healthcare delivery systems**
- **Forging cross-sector partnerships with government, industry, academia, and civil society**

Effective diabetes care requires more than clinical expertise—it calls for a cohesive, society-wide commitment.

Through this plan, JDS reaffirms its dedication to deepening collaboration with academic societies, patient communities, public agencies, and industry leaders to drive meaningful and lasting transformation.

Key Focus Areas in the 5th Plan

This edition places particular emphasis on the latter chapters—Chapter 7 (Engaging Communities), Chapter 8 (Shaping Systems), and Chapter 9 (Preparing for the Future)—which explore the broader societal dimensions of diabetes care. These sections underscore the urgent need for systemic innovation and strengthened cross-sector collaboration.

Another critical focus is the appropriate use and stable supply of diabetes medications. The availability of insulin products and GLP-1 receptor agonists—many of which are manufactured internationally—as well as domestic generic drugs, has been increasingly affected by global disruptions in the pharmaceutical supply chain.

In response, a nationwide educational initiative was launched in 2024 under the TEAM program of the Japan Medical Association. This campaign aims to promote responsible medication use and foster public understanding of health, in collaboration with a broad coalition of academic societies and professional organizations.

Toward a National Diabetes Policy

JDS strongly supports the establishment of a Basic Act on Diabetes Control in Japan. With a substantial portion of the population either affected by or at risk for diabetes, the enactment of such legislation would provide a comprehensive legal foundation for diabetes prevention, care, and research.

Modeled after national frameworks for other chronic diseases, this proposed act would articulate clear principles, objectives, and strategies to guide coordinated, multi-level efforts across healthcare, government, and civil society. It would also promote cross-sector collaboration, ensure equitable access to care, and support evidence-based policymaking tailored to regional needs.

The envisioned national plan under this act would reflect the perspectives of people with diabetes, healthcare professionals, and researchers alike. Through this initiative, Japan can take a critical step toward strengthening its long-term response to diabetes—reducing disease burden, improving healthy life expectancy, and building a more resilient and inclusive healthcare system.

To All Those Living with Diabetes

Our mission is to support all individuals affected by diabetes in leading healthier, more empowered lives. Through this strategic plan, we reaffirm our unwavering commitment to

building a future in which everyone has equitable access to the care, knowledge, and support they need to thrive.

We hope that this General Version of the 5th Five-Year Strategic Plan for Diabetes will serve as a beacon of hope and direction for all those engaged in the field of diabetology—including clinicians, researchers, policymakers, and above all, people with diabetes.

The Japan Diabetes Society
Committee for the 5th Five-Year Strategic Plan for the Fight Against Diabetes

Chair: Toshimasa Yamauchi
Committee Members (in alphabetical order by surname): Ryotaro Bouchi, Akihisa Imagawa, Tatsuya Kondo, Yuka Matoba, Masae Minami, Akinobu Nakamura, Kayako Ryomoto, Asako Sato, Ryo Suzuki, Kayo Waki, Hirotaka Watada, Daisuke Yabe

Note:

This General Version was created through a multi-step process. The Original Version (in Japanese) was first drafted by members of the Committee for the 5th Five-Year Strategic Plan for the Fight Against Diabetes. Based on this, a Japanese General Version was developed with AI-assisted editing to ensure consistency of terminology, clarity of expression, and accessibility to a broader audience beyond specialists. This draft was then carefully reviewed by the committee.

The Japanese General Version was subsequently translated into English with AI support. The translation was further refined by a native English speaker with expertise in the medical field. Finally, the committee members provided oversight, made necessary corrections, and granted final approval, resulting in this finalized text.

II. Review

Review of the 4th Five-Year Strategic Plan for the Fight Against Diabetes

Overview and Objectives of the Plan

In 2020, the Japan Diabetes Society (JDS) launched the 4th Five-Year Strategic Plan for the Fight Against Diabetes, with two primary goals:

1. To reduce the life expectancy gap between people with diabetes and those without.
2. To improve the quality of life (QOL) of people with diabetes.

Given the diverse nature of diabetes and its associated conditions, achieving these goals requires a strong emphasis on personalized care, tailored to each individual's pathophysiology and living environment.

To that end, the plan focused on the following five strategic priorities:

1. Promoting Cutting-Edge Diabetes Research
2. Building Comprehensive Databases and Generating Real-World Evidence
3. Professionals to Lead Future Diabetes Initiatives
4. Raising Public Awareness and Disseminating Information
5. Preparedness for Pandemics and Emerging Health Threats

This chapter reviews the progress made during the five-year period of the 4th plan and evaluates key outcomes in each of these priority areas.

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(1) Progress in Advanced Diabetes Research

One of the foundational elements in realizing personalized diabetes care is a deeper understanding of the pathophysiology of type 2 diabetes. In 2018, a Swedish research team proposed a novel classification framework that grouped individuals with diabetes into five distinct clusters, each characterized by unique clinical features and complication risks.

Building on these insights, an international research collaboration led by Japanese scientists made a significant breakthrough in 2024. By integrating large-scale genetic data from both Japanese and Western populations, the team identified eight new subtypes of type 2 diabetes. The study also highlighted the particularly high genetic susceptibility to non-obese forms of diabetes among Japanese individuals—an area previously underrepresented in global

research.

These advances are contributing to a stronger scientific foundation for tailoring treatment strategies to individual biological profiles, thereby accelerating the transition toward truly personalized and equitable diabetes care.

Significant progress has also been made in diabetes treatment. In people with obesity-related type 2 diabetes, newly developed agents such as GLP-1 receptor agonists and GIP/GLP-1 dual agonists have demonstrated powerful effects on weight reduction, offering benefits that extend beyond glycemic control to broader improvements in metabolic health.

In type 1 diabetes, technological advances in continuous glucose monitoring (CGM) and insulin pump therapy are transforming daily disease management. At the same time, clinical trials of stem cell–derived islet transplantation are steadily progressing, opening up new possibilities for curative therapies that once seemed out of reach.

(2) Building Comprehensive Databases and Generating Real-World Evidence

Advances in treatment have been accompanied by new efforts to harness real-world data for evidence generation. In collaboration with the Japan Institute for Health Security (JIHS), JDS launched J-DREAMS, a nationwide diabetes database integrated with electronic medical records. As of November 2024, the platform includes data from 74 institutions and more than 108,000 individuals. This resource is enabling deeper analysis of complication risks, treatment outcomes, and long-term care trajectories.

Complementing this, a dedicated database for type 1 diabetes—TIDE-J—was established in 2022 as part of JDS's research initiatives. Together, these large-scale datasets are laying the groundwork for more sophisticated, evidence-driven approaches to personalized care.

(3) Fostering the Next Generation of Leaders in Diabetology

To secure the future of diabetes research and care, JDS has continued to invest in the development of human capital. Through programs such as the Career Development Grant and the Advanced Postdoctoral Fellowship**,** JDS has expanded opportunities for early-career scientists, helping to cultivate the next generation of researchers. In parallel, the integration of Japan Society of Experimental Diabetes and Obesity as an official subsection has further strengthened the research ecosystem.

Ensuring adequate clinical capacity is equally important. With growing demand for diabetes care in hospital settings, JDS initiated a national research program in 2022 to examine the role and contributions of board-certified diabetologists in acute care hospitals, using Diagnostic Procedure Combination (DPC) data. This initiative aims to assess whether the work of these specialists is appropriately recognized within current systems and, where necessary, to advocate for structural reforms.

By generating real-world insights and strengthening partnerships with relevant stakeholders, JDS is working to ensure that the contributions of clinical diabetologists are fully supported,

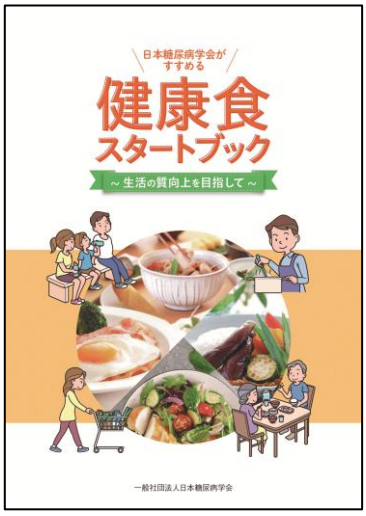
both in policy and practice.

(4) Public Engagement and Awareness Initiatives

JDS, in collaboration with the Japan Association for Diabetes Education and Care (JADEC), has designated the week of November 14—World Diabetes Day—as National Diabetes Week, during which awareness campaigns are conducted across the country. JDS also plays a leading role in the Council for the Promotion of Diabetes Countermeasures in Japan, actively advancing The Diabetic Nephropathy Prevention Program.

Over the past five years, JDS has placed particular emphasis on advocacy initiatives (public campaigns) to elevate public understanding of diabetes. While these efforts have led to broader awareness, gaps in accurate recognition remain. Moving forward, JDS aims to reinforce public messaging in closer alignment with JADEC under a unified strategy.

JDS also promotes evidence-based nutritional education through its official website, where resources such as the Kenkoshoku Startbook, *A Healthy Eating Guide for Daily Life with Diabetes*, are made available to the public. Plans are underway to expand further outreach through diverse media channels—including web articles, mobile health apps, television programs, and advertising—to empower individuals to make informed choices and engage in effective self-care.



(5) Preparedness for Pandemics and Emerging Health Threats

When the 4th Five-Year Strategic Plan was launched in early 2020, the world was entering the first wave of the COVID-19 pandemic. As evidence quickly emerged that diabetes significantly increased the risk of severe illness, JDS responded by actively disseminating accurate, timely information to healthcare professionals and the public.

Looking ahead, building a resilient healthcare system that can respond to future pandemics remains a national priority. The COVID-19 crisis underscored the urgent need to recognize

diabetes as a key risk factor in infectious disease management. Moving forward, JDS continues to strengthen preparedness by promoting the dissemination of accurate information, vaccination, and preventive care—particularly among people with diabetes and those involved in their care.

Future Challenges and Outlook

According to the decennial report *Causes of Death in Japanese People with Diabetes* (Diabetol Int 14, 272–279, 2023) conducted by JDS, the average age at death among people with diabetes has steadily increased—from 71.4 years for men and 75.1 years for women in the 2001–2010 survey, to 74.4 years for men and 77.3 years for women in the 2010–2020 survey.

While this approximately three-year increase suggests steady progress, it also underscores the need for a more detailed evaluation of how the 4th Five-Year Strategic Plan has contributed to improved quality of life and extended healthy life expectancy.

Looking ahead, we remain committed to enhancing our initiatives through robust data collection and analysis. Our goal is to build a society where people with diabetes can live longer lives and healthier, more fulfilling ones.

III. Looking Ahead

Toward the 5th Five-Year Strategic Plan for the Fight Against Diabetes

Diabetes remains a major public health challenge in Japan, affecting more than 11.5 million people—and this number is expected to grow. In type 2 diabetes, the interplay between genetic predisposition and lifestyle factors makes the development of tailored treatment strategies essential. At the same time, research into type 1 diabetes continues to advance, bringing new possibilities for therapies such as islet transplantation and immunomodulation.

Through its previous five-year strategies, JDS has worked to improve quality of life and reduce disparities in life expectancy for people with diabetes. These efforts have centered on promoting personalized care, leveraging digital technologies, and strengthening public engagement.

Building on these foundations, the 5th Five-Year Strategic Plan aims to further refine diagnostic precision, enhance treatment pathways, and introduce novel approaches to ensure that all people with diabetes receive timely, effective, and individualized care.

Establishing a National Diabetes Policy

At the heart of the 5th Five-Year Strategic Plan is the early enactment of a **Basic Act on Diabetes Control**. In Japan, where a substantial portion of the population is either affected by or at risk for diabetes, achieving sustainable progress requires a clearly defined national vision—supported by shared principles, explicit goals, and structured plans in cooperation with stakeholders across sectors.

This proposed legislation would strengthen collaboration with government agencies, facilitate the development of healthcare delivery systems, promote preventive measures, and expand support services. Equally important, the law would play a vital role in addressing the **social stigma and misconceptions** still associated with diabetes.

More than a medical policy, the Basic Act on Diabetes Control represents a societal commitment to building a future in which people with diabetes can live with dignity, security, and full participation in everyday life.

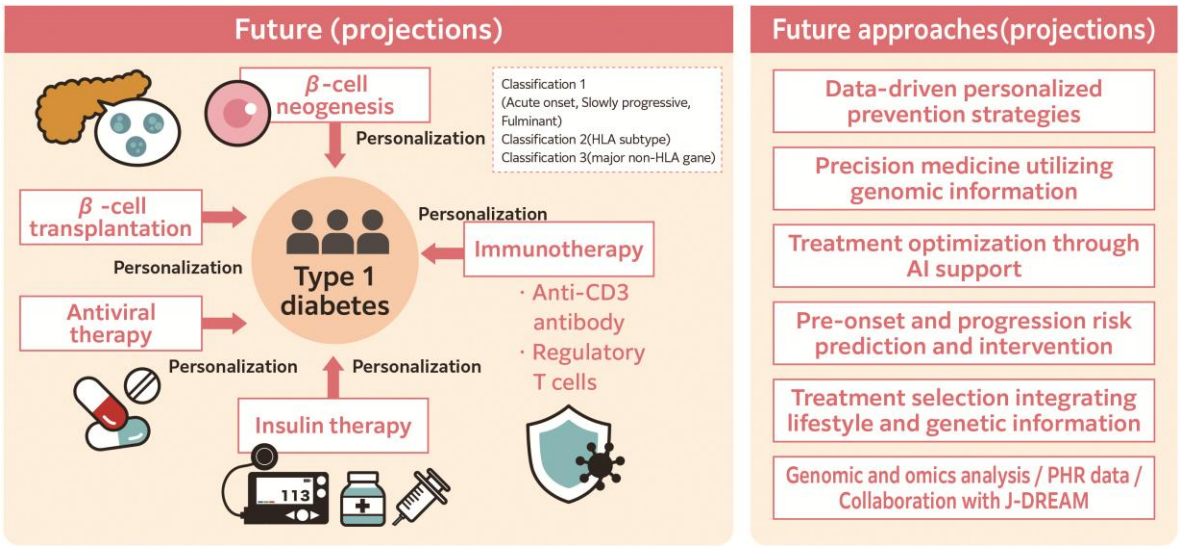
Advancing Diabetes Therapies and Personalized Care

Innovations in Type 1 Diabetes Treatment

While insulin replacement therapy remains the cornerstone of type 1 diabetes management,

recent advances are expanding possibilities for both prevention and long-term disease modification. Research efforts are now focused on the prediction of disease onset, the use of immunotherapies to delay progression, and the regeneration or transplantation of pancreatic β-cells after diagnosis.

In the United States and Europe, clinical studies have shown that administering anti-CD3 monoclonal antibodies—such as **teplizumab**—to high-risk individuals can delay the onset of type 1 diabetes by approximately two years. Similar interventional studies are currently underway in Japan. At the same time, advances in regenerative medicine using iPS cell–derived β-cells and progress in islet transplantation technologies are paving the way for potential curative approaches in the near future.



The Frontiers of Type 2 Diabetes Management

Type 2 diabetes is a complex, multifactorial disease influenced by both genetic and environmental factors. As such, advancing **precision medicine** is essential to provide individualized and effective care. Recent progress in genomics and multi-omics technologies is enabling more precise stratification of patients, allowing clinicians to select optimal therapies based on biological and clinical profiles.

Pharmacological innovation has also accelerated. The emergence of novel agents—including GLP-1 receptor agonists, SGLT2 inhibitors, and GIP/GLP-1 dual agonists—has opened the door to integrated strategies that support both glycemic control and weight management. Looking ahead, further development of multi-functional therapeutic agents is expected to drive more effective and sustainable treatment options for people with type 2 diabetes.

Digital Innovation and the Future of Diabetes Care

Advancements in digital technology are ushering in a new era of diabetes management. The

integration of artificial intelligence (AI), wearable devices, and telemedicine is making it possible to deliver more precise, accessible, and personalized care for people with diabetes.

AI-powered clinical decision support systems are being used to analyze continuous glucose monitoring (CGM) data and offer optimized insulin dosing strategies, along with lifestyle recommendations tailored to individual needs. In ophthalmology, AI-assisted retinal imaging is improving the early detection of diabetic retinopathy—enabling timely intervention and reducing the risk of vision loss.

The expansion of telemedicine and digital health solutions is also transforming how care is delivered. Virtual consultations are reducing the burden of in-person visits, while connected devices allow patients to track and share real-time data on blood glucose, diet, and physical activity with their care teams.

These innovations are creating a more seamless and supportive environment—empowering people with diabetes to manage their condition more conveniently and with greater confidence in their daily lives.

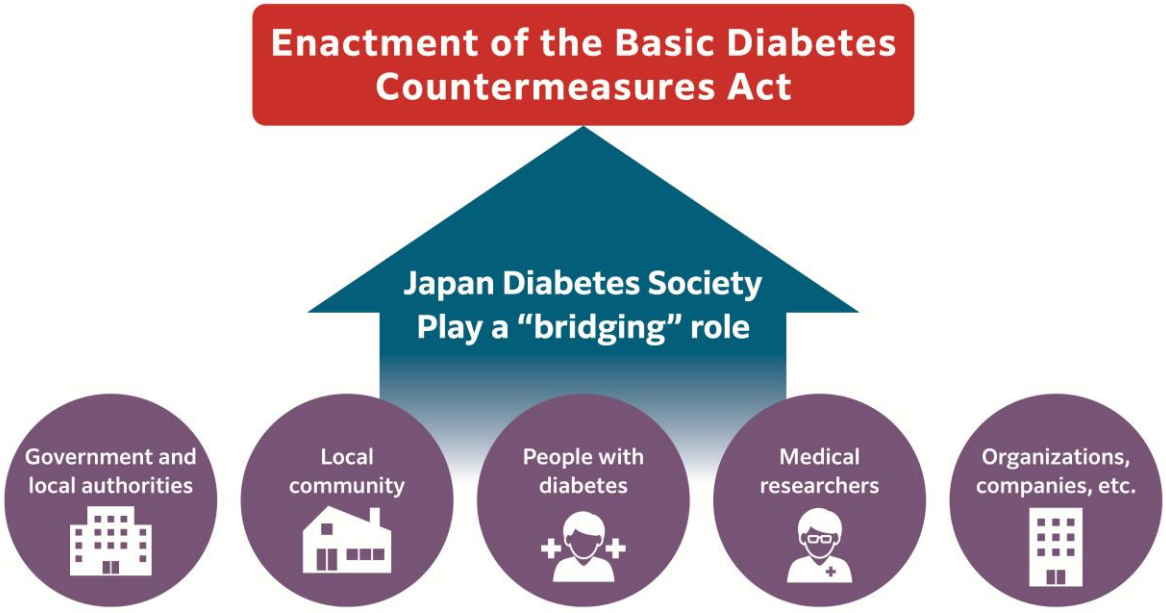
The Vision of the 5th Five-Year Strategic Plan for the Fight Against Diabetes

At the core of the 5th Five-Year Strategic Plan is a clear and urgent priority: the enactment of the Basic Act on Diabetes Control, which will serve as the foundation for a society in which all people with diabetes can access appropriate, equitable care. The plan also emphasizes the importance of promoting the proper use and stable supply of diabetes medications—key steps toward building a sustainable and resilient healthcare system.

Driven by advances in personalized medicine, we are entering an era in which the onset and progression of diabetes, as well as the risks of complications, can be predicted with increasing precision. This enables earlier intervention and empowers individuals to make informed

decisions based on their own risk profiles. As these insights from basic research accumulate and translate into practice, we move closer to a future where it is possible to live a long, fulfilling life with diabetes—a future in which "living well with a chronic condition" becomes the norm, not the exception.

This plan represents a next-generation vision for diabetes care—one centered on personalization, data-driven strategies, and collective action. Its success, and the realization of a national policy framework, will require collaboration across academic institutions, government, industry, and civil society, including the voices of people with diabetes. Through this unified effort, JDS is committed to shaping a future where the burden of diabetes is no longer a limiting force in people's lives.



IV. Advancing Knowledge

Fostering Innovation in Basic and Clinical Diabetes Research

This chapter highlights recent advances in diabetes research and explores future directions that will shape the next generation of science-based care.

Genetic Insights and Personalized Care in Type 2 Diabetes

(1) Genetic Risk Factors in Japanese Populations and Their Clinical Implications

Breakthroughs in genomic analysis have revealed distinct genetic profiles in Japanese individuals compared to Western populations. These findings underscore the need for prevention and treatment strategies tailored to population-specific risks. The use of genetic biomarkers is accelerating progress toward earlier diagnosis and personalized prevention—marking a significant step toward more precise, targeted interventions.

(2) Emerging Research on Future Therapeutic Targets

Cutting-edge research is shedding light on the biological processes that underlie the progression of diabetes. Technologies such as proteomics and metabolomics are identifying biomarkers that may serve as early indicators of disease progression. These discoveries open the door to more timely therapeutic interventions.

Moreover, by applying machine learning techniques to large-scale healthcare datasets, researchers are developing personalized treatment strategies that reflect the unique clinical and biological profiles of each person with diabetes.

New Horizons in Type 1 Diabetes Treatment

(1) Pancreas and Islet Transplantation

Pancreas and islet transplantation continue to be active areas of clinical practice. Islet transplantation, in particular, offers a minimally invasive approach to restoring insulin secretion by supplementing pancreatic β-cell function—thereby contributing to improved glycemic control in eligible patients. Research into the use of porcine islets is also underway, offering a potential solution to the ongoing shortage of human donors.

Additionally, a new framework has been established to support the research use of donated islets that could not be used for transplantation—ensuring that these precious contributions

continue to advance medical science and benefit others. In partnership with the Japan Society for Transplantation and the Japan Pancreas and Islet Transplant Association, a centralized system has been created for the distribution of research-grade islets. This initiative marks an important step in improving transplant techniques and accelerating the development of novel therapeutic options by making optimal use of these invaluable biological resources.

(2) Stem Cell–Based Therapies

Stem cell–derived approaches for regenerating pancreatic β-cells have advanced considerably in recent years. Of particular interest is the use of human pluripotent stem cells (hPSCs), including induced pluripotent stem cells (iPSCs), to generate insulin-producing cells (IPCs) for therapeutic transplantation. While challenges remain, clinical trials in this area have begun to report encouraging outcomes, paving the way for regenerative therapies that could one day transform the standard of care for type 1 diabetes.

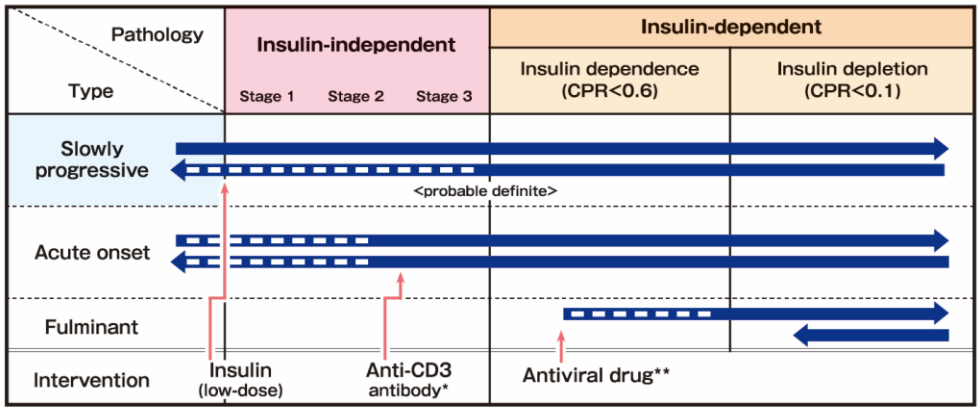
(3) Immunotherapy

Immunomodulatory therapies have long been explored in Western countries, using a variety of agents to delay or prevent disease onset. The most promising strategy currently involves treating high-risk individuals—such as first-degree relatives with multiple islet autoantibodies and impaired glucose tolerance—with a 14-day course of the anti-CD3 monoclonal antibody **teplizumab**. This approach has been shown to delay the onset of type 1 diabetes by approximately two years. As these therapies continue to evolve globally, Japan is beginning to define clinical processes for identifying individuals who may benefit most from immune therapies.

(4) Antiviral Therapy

Antiviral therapy is emerging as a potential strategy for targeting viral infections—particularly enterovirus infections—that have been implicated in the onset of type 1 diabetes. While still in the early stages of research, initial findings suggest that administering antiviral agents during the early phase of disease onset may help preserve residual insulin secretion. Further studies will be essential to validate the efficacy and clinical utility of this promising approach.

Current Status and Future Prospects of Type 1 Diabetes Treatment



The rightward arrow indicates the progression of β-cell destruction over time. The leftward arrow, though rare, indicates the potential for β-cell function to recover.

* : Clinical trial phase ** : Research phase

Transforming Diabetes Management through Digital Health and AI

(1) Deep Learning for Diagnosis and Management

Digital health technologies are evolving rapidly, offering new opportunities to enhance care for people with diabetes. With the accumulation of vast datasets related to diabetes management, artificial intelligence (AI)—particularly deep learning—has become an increasingly powerful tool for clinical application. By leveraging multimodal data streams, these technologies are expected to improve decision-making in clinical settings and ultimately contribute to better quality of life (QOL) for people with diabetes.

(2) Next-Generation Monitoring and Closed-Loop Technologies

Over the past five decades, glucose monitoring has undergone remarkable evolution—culminating in continuous glucose monitoring (CGM) systems capable of capturing data points every few minutes. These high-resolution datasets provide a dynamic view of glucose fluctuations, enabling more precise and responsive diabetes care. From optimizing insulin dosing to powering fully automated closed-loop systems—commonly known as artificial pancreas technologies—CGM has become the cornerstone of intensive diabetes management.

In parallel, in silico trials—computer-based simulations that model human physiology—have been adopted as a powerful alternative to traditional animal testing. Since their formal recognition by the U.S. FDA in 2008, these methods have significantly reduced the need for animal experimentation in algorithm development. Today, insulin delivery algorithms designed through in silico simulations are actively used in clinical practice, helping to reduce the daily burden of care for people with type 1 diabetes and opening new possibilities for safer, more responsive technologies.

(3) Digital Health and Behavioral Change

The integration of digital tools into healthcare—often referred to as digital health and digital medicine—is expanding the possibilities for diabetes prevention, treatment, and self-management. Combined with wearable devices, mobile applications are now enabling users to record biometric data such as blood glucose, blood pressure, and weight, while providing feedback that supports personalized decision-making and improved metabolic control.

Yet, while these systems show promise, sustaining meaningful behavioral change remains a challenge. Future research will focus on optimizing the effectiveness of app-based interventions, including the ideal frequency and timing of feedback, user interface design, and strategies to foster long-term engagement in healthier behaviors.

Bridging Scientific Discovery and Human Impact

Cutting-edge research in diabetes is driving transformative progress in treatment and long-term outcomes. Advances in genetics, data science, regenerative medicine, artificial intelligence, and digital health are making the vision of truly personalized care an achievable reality.

Realizing this potential in clinical practice will require strong interdisciplinary collaboration among healthcare providers, researchers, and technology developers. As new therapies emerge, it is equally essential to uphold the highest standards of safety, ethics, and equity in their adoption and application.

JDS envisions a future in which all people with diabetes can access less burdensome treatments and lead healthier, more fulfilling lives. Through this strategic plan, we are committed to translating scientific insights into tangible benefits—helping to build a society where longevity is not just measured in years, but in quality, dignity, and opportunity.

V. Orchestrating Intelligence

Building Integrated Databases and Harnessing Device-Generated Health Data

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Evolving the Ecosystem for Health Data Utilization in Japan

Japan is undergoing a transformative shift toward a data-driven society under the national vision of “Society 5.0”—a concept that seeks to blend advanced technologies such as artificial intelligence (AI) and the Internet of Things (IoT) into all aspects of life, including healthcare. Within this framework, the use of medical and lifestyle-related data is expanding, with particular focus on improving the quality of care and reducing disparities in access through telemedicine and information sharing.

Despite growing interest and investment, however, challenges remain. Electronic health records (EHRs) and personal health records (PHRs) are often based on non-standardized formats, making seamless data integration difficult. The lack of interoperability across vendors continues to hinder the development of unified, patient-centered systems.

To address these issues, the “Establishment of an Integrated Health Care System” project was launched in fiscal year 2023 as part of the Strategic Innovation Promotion Program (SIP) in Japan. This cross-sectoral initiative aims to realize “optimal health care for each individual” through collaboration among academia, industry, and government. It advances five core pillars: research and development (R&D), system reform, business development, fostering public acceptance, and human resource development.

Transforming Diabetes Care Through Digital Devices

Technological innovation is redefining how diabetes is managed. In recent years, digital tools such as real-time continuous glucose monitoring (rtCGM) and intermittently scanned CGM (isCGM) have complemented traditional self-monitoring of blood glucose (SMBG). These technologies now enable real-time data sharing via smartphone applications—facilitating more dynamic, informed care.

Automated insulin delivery systems that respond to glucose fluctuations are particularly transforming the management of type 1 diabetes. Moreover, integration with platforms like J-DREAMS is advancing the potential for more efficient and individualized treatment plans across the healthcare system.

Yet, challenges remain. Adoption of these devices and therapies varies widely between facilities and physicians, and the associated time and resource demands can be significant. In response, JDS released a consensus statement titled "Consensus Statement on Novel

Glycemic Metrics Derived from Advanced Medical Devices". This document aims to guide the appropriate use of technologies and promote standardized education on insulin pump therapy.

In type 2 diabetes, CGM use is currently limited to individuals receiving insulin or injectable therapies. Those managed with oral medications or lifestyle interventions typically do not benefit from these technologies. While international studies have shown CGM to be effective in improving glycemic control, concerns regarding potential adverse events highlight the need for further evaluation of broader applications.

At the centennial symposium marking 100 years since the discovery of insulin in November 2021, JDS emphasized the importance of redefining diagnostic concepts in diabetes. Moving beyond HbA1c alone, CGM data offers a more nuanced view of glycemic variability—paving the way for future updates to algorithms for pharmacotherapy and a deeper understanding of disease mechanisms.

Harnessing IoT and AI to Advance Nutritional and Exercise Therapies

Lifestyle interventions—particularly nutrition and physical activity—remain foundational components of diabetes care. In recent years, the integration of IoT-enabled smart devices and AI-driven applications has opened new possibilities for personalized support and behavior change.

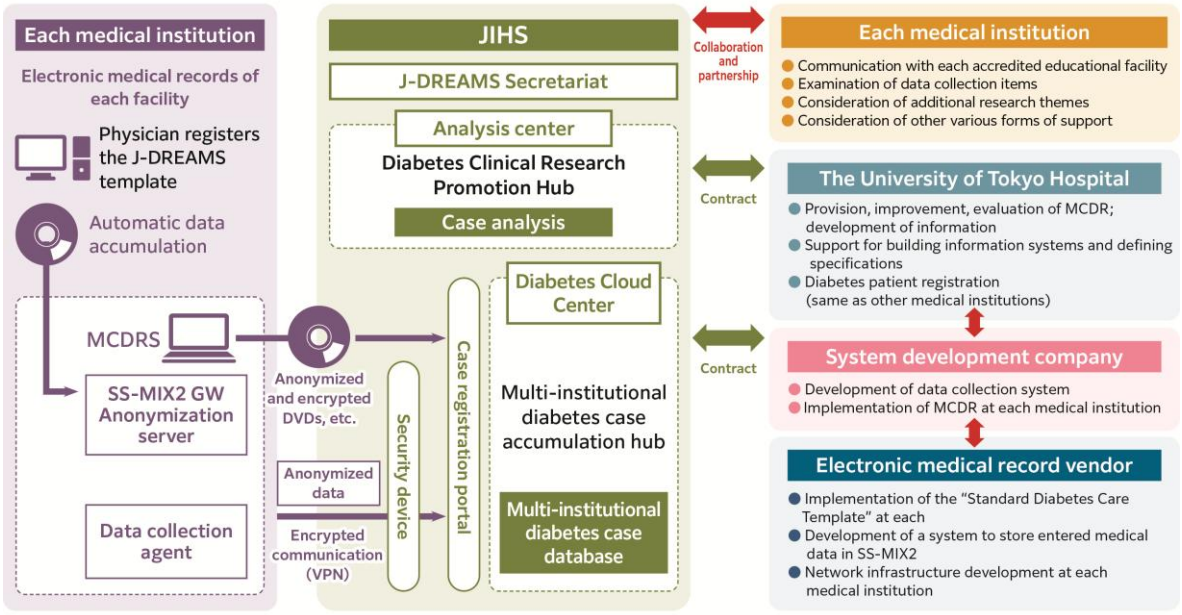
In Japan, the large-scale PRISM-J clinical trial evaluated an IoT-based intervention designed to encourage healthier habits. While the program led to measurable behavioral changes, it did not significantly reduce HbA1c levels—highlighting the need for more sophisticated systems that integrate CGM data and deliver individualized feedback.

For Japan’s aging population, increasing adoption and long-term engagement with digital tools remains a key challenge. In a randomized controlled trial involving individuals with diabetes-related kidney disease, the use of a self-management support app led to improvements in both HbA1c and renal function indicators. Results from a physician-led clinical study are expected in 2025, which may further validate the potential of these tools. Additionally, app-based dietary feedback from registered dietitians has shown early promise in improving glycemic control.

Looking ahead, a central question remains: Can dietary management apps contribute to long-term risk reduction in type 2 diabetes? In type 1 diabetes, the use of digital tools that integrate food and exercise tracking with carb counting is currently being evaluated for its potential to support insulin dose calculations. When integrated with CGM and automated insulin delivery (AID) systems, these platforms may represent the next frontier in personalized, data-driven care.

Leveraging the Power of J-DREAMS: A National-Scale Diabetes Database

In 2015, JDS and the National Center for Global Health and Medicine [NCGM] (now the Japan Institute for Health Security [JIHS]) launched **J-DREAMS (**the **J**apan **D**iabetes comp**RE**hensive database project based on an **A**dvanced electronic **M**edical record **S**ystem**)** has become a cornerstone of diabetes research in Japan. As of March 2024, the database has aggregated clinical data from over **100,000 individuals across 73 institutions**, offering a comprehensive view into real-world diabetes care and the progression of complications.



This platform is already accelerating progress in multiple areas—including collaborative research on diabetic kidney disease with Japanese Society of Nephrology, and the development of AI-powered algorithms for treatment decision-making.

Looking ahead, the integration of **J-DREAMS with personal health records (PHR), genomic data, and multi-omics datasets** is expected to unlock new possibilities in precision medicine. Under the support of Japan Agency for Medical Research and Development [AMED], large-scale collection and analysis of diabetes-related biosamples is underway. As collaboration with J-DREAMS deepens, this integration is expected to drive new insights into the pathophysiology of diabetes and its complications—and to support the development of tailored treatment strategies.

By expanding participation in J-DREAMS to **100 institutions and 200,000 individuals** over the next five years, JDS aims to build a stronger foundation for advanced analytics. The goals are clear: develop AI tools to support clinical decision-making, generate real-world evidence on the efficacy and safety of new therapies, and ultimately, deliver more precise, individualized care to people with diabetes —contributing to a more equitable and connected healthcare system for the future.

VI. Nurturing Teams

Cultivating the Next Generation of Leaders in Diabetes Care and Research

Developing and sustaining a skilled workforce is essential to advancing future strategies for diabetes care and research. As healthcare moves toward more tailor-made and data-driven approaches, there is a growing need to train and support not only diabetes specialists but also a broad range of healthcare professionals and scientific researchers.

This chapter highlights ongoing initiatives to foster the next generation of experts and to create an environment where innovation in both clinical care and research can thrive. These initiatives collectively reflect JDS's commitment to expanding team-based care, promoting diversity, enabling task shifting, and strengthening digital integration.

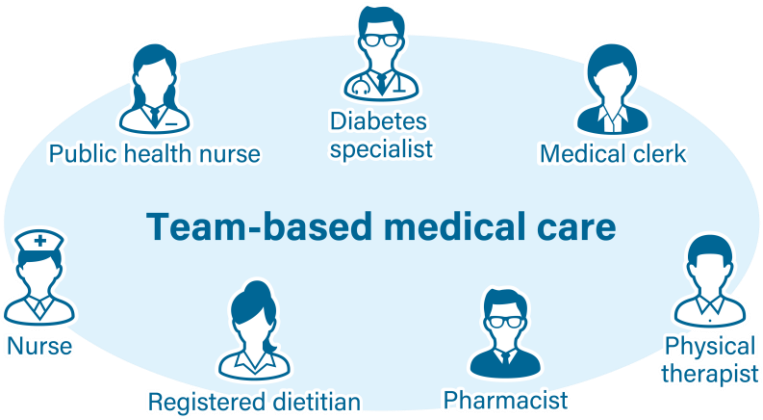
Key Initiatives for Workforce Development

(1) Developing Healthcare Professionals in Diabetes Care

Diabetes care requires a multifaceted approach, grounded in the principles of team-based medicine. As Japan's population continues to age and life expectancy increases, the demand for diabetes-related healthcare is expected to grow. It is no longer feasible for diabetes specialists to manage care alone; the role of allied healthcare professionals has become more vital than ever.

Certified Diabetes Educators (CDEJs) and regional CDEs (CDELs) are playing active roles across the country. However, challenges such as declining new certifications and the burden of credential renewal have begun to emerge. To ensure high-quality, interdisciplinary care, support systems must be enhanced and professional environments better structured to empower each team member to contribute their expertise.

Administrative professionals are also becoming increasingly important, particularly in navigating the growing complexity of medical billing and reimbursement systems. As integral members of the care team, their training and development will be key to ensuring operational efficiency and coordinated patient care.



In addition, one of the policy priorities set forth by JDS in its call for a Basic Act on Diabetes Control is to promote early diagnosis and early intervention. To achieve this, increasing participation in general health checkups and specified health examinations will be critical. Public health nurses play a pivotal role in delivering health guidance and connecting individuals to timely care. Strengthening their training—particularly in collaboration with local governments—will be essential for expanding prevention efforts and reducing the risk of disease progression.

(2) Developing Diabetes Specialists and Clinical Trainers

Diabetes specialists form the foundation of effective team-based care. JDS has long maintained a rigorous board certification process to ensure the training of highly qualified experts. However, recent structural reforms under Japan's new medical specialist system have altered career pathways, resulting in a notable decline in the number of internal medicine residents pursuing subspecialties—including diabetes.

To address this, JDS is working closely with the Japanese Board of Medical Specialties, the Japanese Society of Internal Medicine, and the Japan Endocrine Society to align training programs with the curriculum for the Endocrinology, Metabolism, and Diabetes subspecialty. The goal is to create a seamless and clearly navigable pathway from initial training in internal medicine to full certification and renewal as a board-certified diabetes specialist.

Equally essential is the development of experienced clinical trainers who can serve as mentors and educators in accredited training facilities. The ability of certified specialists and trainers to fully apply their expertise—and to find professional fulfillment in doing so—is often a decisive factor in inspiring the next generation of residents to choose a career in diabetology. To support this, a more structured framework is needed—one that recognizes the value of board certification and training roles and offers appropriate incentives for maintaining these important qualifications.

(3) Fostering the Next Generation of Diabetes Researchers

Driving progress in diabetes research—both at the basic and clinical levels—is essential to deepening our understanding of the disease and improving patient outcomes. However, the number of academic publications from Japan in this field has plateaued in recent years,

highlighting the urgent need to strengthen research capacity and cultivate new talent.

To address this, JDS has established a range of support mechanisms for early-career scientists. These include the Young Investigator Award (YIA), research grant programs for junior faculty, the Career Development Grant, and a fellowship system for emerging researchers. In addition, flexible support measures have been introduced to help researchers continue their work during and after life events such as childbirth or caregiving responsibilities—ensuring continuity and inclusivity in research careers.

JDS is also investing in initiatives that promote peer-to-peer exchange and national networking among young investigators. These efforts include dedicated sessions for young researchers and support for participation in international scientific conferences. Looking ahead, JDS will continue to foster environments where collaboration flourishes and a new generation of researchers can shape the future of diabetes science.

(4) Advancing Diversity and Building a Supportive Work Environment

As of 2023, women account for 35.4% of the membership of JDS—well above the national average of 23.6%. Among members in their twenties, the proportion exceeds 50%. Despite this progress, women remain underrepresented in leadership roles, comprising just 21.5% of certified clinical trainers. In response, JDS set a target to increase female representation among academic councilors and session chairs as part of its Five-Year Strategic Plan—and successfully reached the 15% milestone. Looking ahead, JDS is working toward the national gender equality goal of raising women's representation in leadership positions to 30%.

In 2020, JDS established the Committee for the Promotion of Diversity to support individuals from all backgrounds—regardless of gender—in pursuing career paths aligned with their personal and professional goals. Through academic conference programming and dedicated resources on its website, JDS is helping to expand awareness of diverse working styles and career development options in diabetes care and research.

With the national physician workstyle reform law coming into effect in April 2024, physician overwork has drawn increased public attention as a systemic issue. Diabetes care, which has long embraced team-based practice and rarely involves emergency interventions, is particularly well suited to more flexible, sustainable workstyles. By enhancing policies that support physicians through childbearing and caregiving, improving access to onsite childcare and online conference attendance, and strengthening online education for non-specialists and allied professionals, JDS is striving to build an inclusive and resilient system where all healthcare providers can thrive.

Task Shifting: Building a More Sustainable Model for Diabetes Care

In the face of limited healthcare resources, task shifting has emerged as a promising strategy to enhance collaboration across disciplines and build a more sustainable, high-quality care

system. By enabling each professional involved in diabetes care to contribute their expertise more effectively, task shifting allows for better distribution of responsibilities while preserving the quality of care.

When diabetes specialists and medical staff work together in a well-coordinated model, each focusing on roles aligned with their training and skills, the result is not only greater efficiency but also advancement in tailor-made care—the core vision of the Five-Year Strategic Plan for Diabetes. This approach contributes to improved patient outcomes while making optimal use of existing medical resources.

Task shifting can be viewed through three interrelated lenses:

1. **Who performs the task** – reallocating roles among different healthcare professionals
2. **Where the task is delivered** – expanding care from clinical settings into communities, homes, and care facilities
3. **How the task is performed** – leveraging digital technologies to streamline delivery and enhance efficiency

JDS is actively promoting the following initiatives in line with these dimensions:

- **Expanded scope of practice for nurses through certified training**: Empowering nurses to perform defined clinical tasks, such as adjusting insulin dosages, through targeted training programs
- **Support for Certified Diabetes Educators (CDEJs)**: Exploring ways to reduce the burden of certification and renewal to enhance specialist availability
- **Utilization of physician assistant billing incentives**: Strengthening the role of administrative professionals to allow physicians to focus on clinical expertise
- **Advancing medical digital transformation (DX)**: Promoting integration of electronic medical records and device data to improve care coordination and workflow

Through these integrated efforts, JDS is laying the foundation for a more adaptive and sustainable model of diabetes care—one that maximizes the contributions of each team member and brings tailor-made medicine closer to reality.

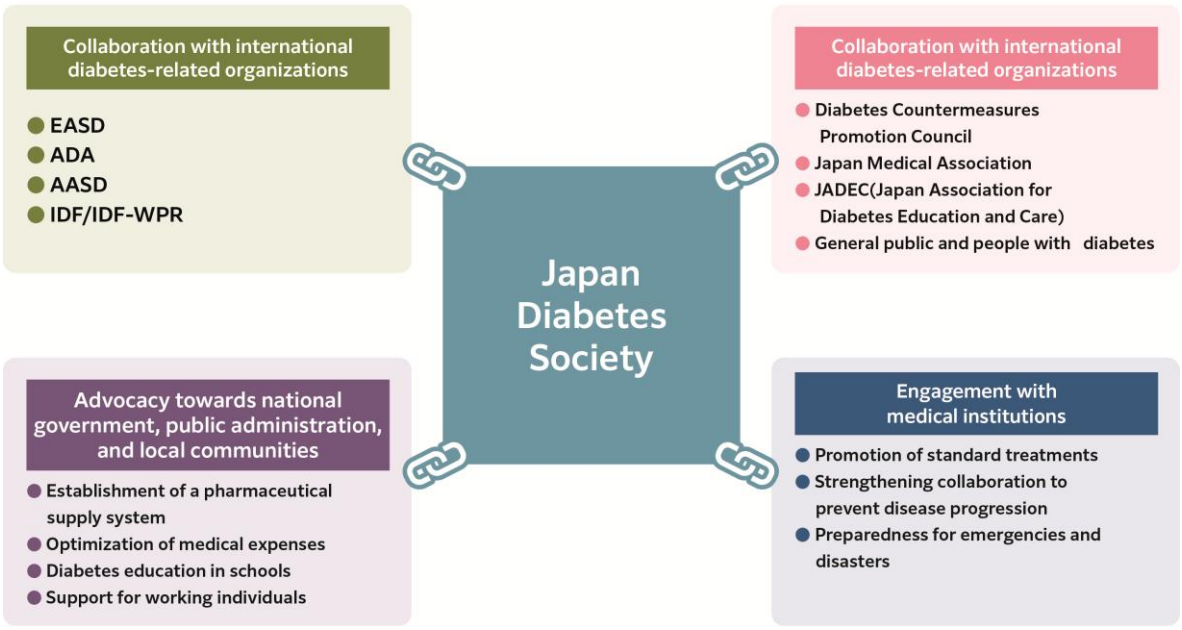
Fostering Talent to Sustain the Future of Diabetes Care and Research

Sustained investment in human capital is essential to securing the future of diabetes care and research. The 5th Five-Year Strategic Plan for the Fight Against Diabetes envisions a system where professionals across disciplines can thrive in their roles and contribute to nurturing the next generation.

By creating environments where each individual involved in diabetes care—whether clinician, researcher, or support staff—can grow, lead, and feel valued, we move closer to a more resilient, inclusive, and sustainable healthcare system, delivering high-quality, personalized diabetes care.

VII. Engaging Communities

Engaging in Two-Way Communication with the Public, Society, and the Global Community



1. Background and Challenges

JDS has long sought to deepen dialogue with the public and broader society, with the aim of fostering greater understanding of diabetes and improving care environments. Guided by the Five-Year Strategic Plan for the Fight Against Diabetes, JDS has advanced awareness campaigns, implemented supportive measures, and contributed to strengthening diabetes-related initiatives both domestically and internationally.

A Look Back: Milestones from Past Strategic Plans

The First Plan (2004)

- Prioritized improving diabetes prevention, diagnosis, and treatment environments. In collaboration with the Japan Medical Association and the Japan Association for Diabetes Education and Care (JADEC), the Japan Council for Promotion of Countermeasures against Diabetes was established to promote early detection and prevent treatment discontinuation through public lectures and community outreach.
- In 2007, JDS, together with JADEC and the Japan Medical Association, jointly formed the World Diabetes Day (WDD) Implementation Committee as a member of the International Diabetes Federation (IDF), launching nationwide Blue Light-up campaigns to raise public awareness.

The Second Plan (2010)

- Focused on building and disseminating evidence-based practices and strengthening diabetes prevention. In 2012, a reduction in the number of individuals at risk for diabetes was reported for the first time.
- Amid growing public interest in extreme carbohydrate restriction, JDS promoted balanced nutritional guidance—leading to widespread engagement.
- Co-hosted joint conferences with the IDF Western Pacific Region (IDF-WPR) and the Asian Association for the Study of Diabetes (AASD), furthering international collaboration.

The Third Plan (2015)

- Centered on public engagement and communication, with a strategic goal of creating a society where diabetes doesn't take hold or take over.
- In 2016, as a lead member of the Japan Council for Promotion of Countermeasures against Diabetes, JDS worked to expand nationwide implementation of "The program for prevention aggravation of diabetic nephropathy."
- In 2018, jointly released the "Practice Guideline for the Treatment of Elderly Diabetes in Japan" with the Japan Geriatrics Society, contributing to age-appropriate care across life stages.

The 4th Plan (2020)

- Introduced the concept of "10 million ways of personalized medical care," emphasizing tailored diabetes strategies across the life course—from childhood to older age—and reinforced policy advocacy.
- Partnered with JADEC to successfully advocate for national approval of intranasal glucagon administration by non-family school personnel, enabling safe and effective intervention for students with type 1 diabetes.
- Collaborated with stakeholders including JADEC and Japan Pharmaceutical and Diabetes Society to stabilize the supply chain of diabetes medications through national-level negotiations.
- Provided scientific evidence supporting the need for advanced glucose monitoring technologies (e.g., real-time CGM) and advocated for policies to reduce the financial burden of care.
- In 2024, published the "Kenkoshoku Startbook" on its official website, delivering accurate, accessible nutritional education to the general public.
- In 2023, co-hosted the IDF-WPR and AASD conferences with JADEC to strengthen regional strategies for diabetes control across the Asia-Pacific region.

Promoting Continued Treatment to Prevent Diabetes-Related Complications

As of 2019, approximately 11.5 million people in Japan were living with diabetes. Although this figure is slightly lower than the projections outlined in *Health Japan 21 (Second Term)*, the number continues to rise into 2024. Notably, nearly 30% of people with diabetes are not receiving appropriate treatment, and over 15,000 individuals started dialysis in 2021. The risks of vision loss and cardiovascular disease also remain elevated.

In response to these realities, *Health Japan 21 (Third Term)*—launched in 2023—emphasizes a life course approach to prevention and care, the use of personal health records, and the development of supportive environments that enable healthy choices. These policy directions align closely with JDS's commitment to promoting early intervention and sustained, individualized treatment.

Preventing disease progression requires ongoing access to care and long-term adherence to treatment plans tailored to each person's clinical needs. Strengthening education and support for regular follow-up is essential to reducing complications and improving quality of life for people with diabetes.

Building a Resilient Support System for Diabetes Care in Times of Disaster

Under disaster conditions, people with diabetes are especially vulnerable to metabolic instability. Ensuring the availability of medications and maintaining care delivery systems is essential for their safety and health. In collaboration with JADEC, JDS published the *Diabetes Care Providers' Manual for Disaster Diabetes Care* and promoted the establishment of the Diabetes Medical Assistance Team (DiaMAT).

Through ongoing education and training programs, DiaMAT enhances healthcare professionals' preparedness for emergency response. In the 2024 Noto Peninsula Earthquake, DiaMAT worked in close partnership with the Japan Medical Association and other stakeholders to deliver coordinated care to affected regions.

Addressing Diabetes-Related Stigma and Advancing Advocacy

JDS, in collaboration with JADEC, continues to lead advocacy efforts aimed at promoting public understanding and accurate knowledge about diabetes. Despite progress, deep-rooted stigma persists and can result in disadvantages in employment, marriage, and other aspects of life. This social bias, often fueled by misinformation, may lead individuals to conceal their condition, ultimately increasing the risk of disease progression due to missed treatment opportunities. The Japan Diabetes Society and JADEC are jointly committed to building a society where people with diabetes can live freely and without fear of judgment—through sustained efforts in public advocacy and education.

As part of broader efforts to address stigma, discussions around updating the terminology used to describe diabetes have been taking place within a joint advocacy committee established by the Japan Diabetes Society and JADEC in 2019. In 2023, "Diabetes" was

formally selected as a leading candidate for a revised designation by the boards of both organizations. To promote inclusive and constructive dialogue, the committee has engaged in public conversations with community members and relevant stakeholders, exchanging perspectives on the social implications of terminology. These efforts aim to build consensus around a name that reflects stakeholder values and fosters understanding across society.

In parallel, the joint advocacy committee established by the Japan Diabetes Society and JADEC is working closely with the Asian Association for the Study of Diabetes (AASD) and the IDF Western Pacific Region (IDF-WPR) to address shared challenges across the region—such as cultural stigma associated with existing terminology, including Chinese characters that reference "urine." In line with the Ulaanbaatar agreement published in 2024, the committee has endorsed the candidate term “Diabetes” (rendered in Japanese as ダイアベティス) as a culturally sensitive alternative. Building on this consensus, the committee aims to foster inclusive dialogue and support region-wide efforts toward more respectful and socially attuned terminology in diabetes care.

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2. Action Plan

Communicating with Society

- JDS will continue to strengthen our advocacy efforts with JADEC to dispel social stigma and improve public understanding of diabetes. Through public lectures, digital platforms, and social media outreach, JDS aims to foster a society where accurate knowledge empowers individuals and communities alike.
- JDS will invest in early health education by expanding school-based programs such as Kids' Seminars and mobile classroom initiatives. By emphasizing diabetes prevention and healthy lifestyle habits from childhood, JDS aim to cultivate long-term awareness. In parallel, JDS will amplify the voices of people with diabetes and their families through academic forums and JADEC collaborations, and use these insights to inform future research and support young investigators.
- JDS is committed to strengthening emergency preparedness by working with local diabetes councils, medical associations, JADEC, and CDE organizations. Together, JDS will establish a coordinated framework that enables the timely deployment of DiaMAT across all prefectures when disaster strikes.

Engaging with Government and Local Communities

- JDS will strengthen policy advocacy in partnership with the Japan Medical Association, JADEC, and the Japan Diabetes Council to advance legal frameworks that support the prevention and management of diabetes and its complications.
- JDS will work closely with the Ministry of Health, Labour and Welfare to promote standardized treatment practices, accelerate the introduction of innovative therapies, and establish a stable supply system for diabetes medications—all toward expanding access and reducing financial barriers.

- JDS will advocate for the inclusion of diabetes and lifestyle disease education in school curricula, promoting anticipatory, prevention-oriented health education linked to diet and physical activity.
- In collaboration with industry and local governments, JDS will support the development of employment environments that enable people with diabetes to continue treatment without compromising their careers.

Expanding Global Partnerships and Communicating with the World

- JDS will continue to strengthen the content and visibility of our official journal, *Diabetology International*, to ensure that research from Japan reaches a wider international audience.
- In collaboration with global organizations such as the International Diabetes Federation (IDF) and the IDF Western Pacific Region (IDF-WPR), JDS will share insights on the current state of diabetes care and policy in Japan and abroad. Within IDF-WPR, JDS will contribute to harmonizing diabetes care in the region through the advancement of advocacy initiatives, the updating of emergency response guidelines, and the development of treatment algorithms.
- JDS will actively engage in joint symposia and research collaboration with the European Association for the Study of Diabetes (EASD), the American Diabetes Association (ADA), and the Asian Association for the Study of Diabetes (AASD), with the aim of strengthening international research networks and elevating Japan's global presence in diabetology.

Walking Together with People Living with Diabetes JDS as a Scientific and Social Advocate

JDS has long championed efforts to raise awareness of diabetes prevention and treatment, address stigma, and improve care environments through dialogue with society. In tandem with global partnerships and policy advocacy, JDS continues working toward a society where people with diabetes and their families can live with dignity and peace of mind.

At the 67th Annual Meeting of the Japan Diabetes Society, JDS hosted a groundbreaking session titled "Hear the Voices of People with Diabetes." For the first time, people living with diabetes and their family members were welcomed to participate free of charge. The session created a space for open, two-way dialogue between healthcare providers and individuals with lived experience—fostering mutual understanding and collaborative problem-solving. The courage of participants to speak out was met with sincere engagement from medical professionals. Through this exchange, the principle of "Nothing about us without us" was brought to life—not merely as a phrase, but as a guiding stance for future practice.

Participants were also reminded that stigmatization can inadvertently arise from the very words and behaviors of healthcare providers. The dialogue highlighted the importance of whole-person care that extends beyond HbA1c values and encompasses the lived reality of

each individual.

JDS believes that being visibly engaged with people living with diabetes is foundational to building mutual communication with the public, society, and the world. We are committed to carrying forward the insights gained from this initiative—transforming voices into action, and working hand in hand with those affected to shape future health policy.

VIII. Shaping Systems

Fostering Collaboration Across Disciplines, Communities, and Government

This chapter explores three strategic themes:
1. Enhancing reimbursement structures and clinical delivery systems;
2. Advancing standardized care through collaboration with academic societies; and
3. Addressing regional disparities by establishing equitable systems and promoting the adoption of evidence-based treatment.

Through these initiatives, we aim to create a supportive environment where healthcare professionals can thrive, while building a sustainable framework that ensures all people with diabetes have access to high-quality, timely care—wherever they live. By strengthening the foundations of care delivery, these efforts also contribute to shaping forward-looking health policies nationwide.

Delivering High-Expertise Diabetes Care Backed by Reimbursement Reform

Background and Challenges

In Japan, core hospitals such as university medical centers are designated to prioritize inpatient care under current national healthcare policies. At the same time, advances in diabetes management have shifted the locus of care from inpatient to outpatient settings. However, as the number of people with diabetes continues to rise—particularly among older adults—the proportion of inpatients with diabetes is also increasing year by year.

In designated training hospitals, diabetes specialists play a pivotal role in perioperative glucose management, significantly contributing to surgical outcomes. Despite this critical involvement, there are currently no specific reimbursement incentives that recognize their efforts. Similarly, intensive, data-driven guidance provided by interdisciplinary diabetes care teams often goes unrewarded. There is a pressing need to advocate for the introduction of new reimbursement categories that appropriately reflect the value of these contributions.

Current Initiatives and Future Outlook

To lay the groundwork for appropriate reimbursement reforms, JDS conducted a nationwide survey in 2021 assessing inpatient diabetes care in acute-care hospitals. The results demonstrated the vital contributions of diabetes specialists in hospital settings.

Looking ahead, we will focus on enhancing the quality of diabetes care through team-based approaches while building a robust body of evidence to show that specialist intervention improves patient outcomes and reduces overall healthcare costs. By making visible the often-overlooked labor burden involved in diabetes management, we will continue

advocating for reimbursement reforms and improved payment systems that appropriately recognize specialist contributions and the true value of team-based diabetes care—essential steps toward building a sustainable healthcare system.

Collaborating with Academic Societies to Advance Integrated Diabetes Care

Bridging Disciplines for Better Outcomes

Diabetes intersects with a wide range of clinical fields. Recognizing this, JDS is working hand-in-hand with other academic societies to enhance healthcare systems and policy frameworks. Together, we aim to standardize care while also paving the way for more personalized treatment approaches.

(1) Japan Society of Clinical Oncology / Japanese Society of Medical Oncology

In 2023, JDS released the third report of the Joint Committee on Diabetes and Cancer: Summary of the Results of a Questionnaire Survey of Oncologists and Diabetologists. This report included the results of a nationwide survey of oncologists and diabetes specialists regarding perceptions of diabetes management during cancer treatment. Many respondents emphasized the need for clearer goals, heightened attention to glucose control, and the development of specific guidelines—particularly during chemotherapy.

Looking ahead, the societies involved will collaborate to issue a consensus statement on glucose management for people with cancer. This initiative is expected to improve diabetes care during cancer treatment, ultimately contributing to better patient outcomes and survival rates.

(2) Japan Geriatrics Society

In 2023, Practice Guideline for the Treatment of Elderly Diabetes in Japan 2023 marked a significant shift in the approach to diabetes care in older populations. The new guidelines recommend relaxing glycemic targets for individuals at high risk of hypoglycemia based on comprehensive geriatric assessment (CGA), and emphasize the importance of adequate energy and protein intake to prevent frailty.

Going forward, we aim to establish practical, evidence-based strategies to support diabetes care in older adults through coordinated efforts that span healthcare, long-term care, and community support. These efforts are designed to improve quality of life and extend healthy life expectancy for older people with diabetes.

(3) The Japanese Society for Pediatric Endocrinology

In 2024, an updated edition of the *Consensus Guideline for the Treatment of Pediatric and Adolescent Diabetes in Japan* was published, providing a comprehensive framework for diabetes care in children and adolescents.

Earlier, in 2020, the Japanese Society for Pediatric Endocrinology joined forces with JADEC and JDS to establish the *Committee of Health Care Transition in Type 1 Diabetes*. The committee conducted a nationwide survey on transitional care for young people with type 1 diabetes. Currently, efforts are underway to develop a patient- and family-oriented guidebook to help ensure seamless transition from pediatric to adult care and support continuity of treatment throughout this critical period.

(4) Japan Society of Obstetrics and Gynecology

Gestational diabetes mellitus (GDM) affects approximately 10% of pregnant women in Japan and significantly increases the mother's long-term risk of developing type 2 diabetes. In 2023, the *Japan Society for Diabetes in Pregnancy* issued the *Clinical Practice Guideline for Follow-up Care of Women with a History of Gestational Diabetes Mellitus*, which strongly recommends postpartum lifestyle interventions to prevent disease onset. In line with these recommendations, diabetes specialists and obstetricians are working together to provide long-term health support—not only to reduce future diabetes risk, but also to promote informed preconception care for subsequent pregnancies.

In addition, a joint committee formed by the Japan Society for Diabetes in Pregnancy, the Japan Society of Obstetrics and Gynecology, and JDS is actively working to standardize insulin therapy for GDM and establish supportive healthcare policies. Moving forward, we will continue to build an integrated care framework that ensures appropriate treatment for GDM and enhances the health and well-being of both mothers and their children.

(5) The Japanese Society of Psychiatry and Neurology

People living with schizophrenia or depression face a significantly higher risk of developing diabetes, and some antipsychotic medications are known to elevate blood glucose levels. In 2020, a *Prevention Guide for Obesity and Diabetes in Patients with Schizophrenia* was jointly developed by the Japan Society for the Study of Obesity, the Japanese Society of Psychiatry and Neurology, and JDS. However, there remains limited evidence regarding the effectiveness of preventive interventions and the overall risk of diabetes in these populations—highlighting the need for further research.

Addressing this issue extends beyond standard clinical care and touches on complex social challenges. The next step involves understanding the real-world conditions people face and demonstrating the value of team-based approaches in supporting those at risk. Collaborative, interdisciplinary action is essential to ensure more equitable and effective care.

(6) The Japan Society of Hepatology

In 2021, a joint statement was issued reporting the results of a clinical investigation into the incidence of hepatocellular carcinoma among people with diabetes receiving outpatient care. In 2023, a new term—*Metabolic dysfunction-associated steatotic liver disease (MASLD)*—was proposed to redefine fatty liver disease, reflecting a growing emphasis on its close association with diabetes.

Recognizing the need for interdisciplinary collaboration, the Japan Society of Hepatology and JDS have agreed to continue holding joint research meetings to explore shared clinical challenges and develop more effective strategies for co-managing liver disease and diabetes.

(7) Japanese Society for Treatment of Obesity & Japan Society for Study of Obesity

Obesity and diabetes share common metabolic underpinnings, and both societies have been actively collaborating on clinical practice and research. In 2022, the joint committee issued the *Metabolic surgery in treatment of obese Japanese patients with type 2 diabetes: a joint consensus statement from the Japanese Society for Treatment of Obesity, the Japan Diabetes Society, and the Japan Society for the Study of Obesity*. In 2023, a national survey was conducted to assess the current status of metabolic surgery practices in Japan.

Looking ahead, the societies plan to develop clear eligibility criteria for metabolic surgery and establish appropriate usage guidelines for anti-obesity medications. These efforts aim to standardize obesity care and ensure safer, more effective treatment pathways for individuals living with both diabetes and obesity.

(8) Japanese Society of Nephrology, the Japanese Society for Dialysis Therapy, and the Japan Society of Metabolism and Clinical Nutrition

In 2023, the *Joint Committee on Diabetes Nephropathy and the Working Group for Updated Staging of Diabetic Nephropathy* released a revised classification system for diabetic nephropathy. This updated framework aims to support early detection and slow disease progression through clearly defined clinical standards. The societies also developed referral criteria to ensure timely consultation with nephrology and dialysis specialists, enabling more appropriate and coordinated care across different levels of the healthcare system.

(9) Japanese Circulation Society

The *Diagnosis, Prevention, and Treatment of Cardiovascular Diseases in People with Type 2 Diabetes and Prediabetes — A Consensus Statement Jointly from the Japanese Circulation Society and the Japan Diabetes Society* was first published in 2020. In preparation for its upcoming revision, a joint committee has been convened to reassess the evidence and clinical practice standards. The initiative aims to further integrate cardiovascular care into the management of diabetes and metabolic disorders through interdisciplinary collaboration.

(10) The Japan Society for Transplantation, The Japan Society for Pancreatic and Islet Transplantation

The *Pancreas Transplantation Central Coordination Committee* plays a key role in establishing eligibility criteria for pancreatic transplantation, evaluating accredited institutions, and overseeing regional and operational subcommittees. This work is supported by standing committees of the relevant academic societies. In 2020, the national transplantation guidelines were revised and republished to reflect evolving clinical and regulatory frameworks.

Islet transplantation, a minimally invasive procedure for people with diabetes experiencing severe hypoglycemia, was added to the national insurance system in April 2020. As a regenerative therapy, islet transplantation is governed not by the Organ Transplant Act but under the regulatory framework of the Act on the Safety of Regenerative Medicine. With growing clinical experience and institutional support, this low-burden transplant therapy is expected to continue advancing in the coming years.

(11) The Japan Endocrine Society and the Specialist Certification System

The field of endocrinology, metabolism, and diabetes care has been approved as a subspecialty area under Japan's new medical board certification system. Since 2021, a joint committee established with the Japan Endocrine Society has been working to define certification requirements and develop the necessary infrastructure.

While the transition of board certification authority from the academic society to the national medical certification organization is currently underway, efforts are being made to ensure that internal medicine residents have access to high-quality training and supervision. These efforts also aim to cultivate specialists with a strong foundation of knowledge and a clear commitment to public health. Looking forward, collaborative symposiums at academic meetings are being considered to further strengthen training programs through close cooperation between the two societies.

Addressing Regional Disparities and Engaging with Policy

Significant regional disparities in diabetes care remain a pressing issue in Japan. Certain areas—particularly Hokkaido, Tohoku, and the Kanto-Koshinetsu regions—continue to face a shortage of diabetes specialists. With the projected decline in internal medicine trainees, further reductions in the number of certified diabetes specialists are also anticipated.

To close these gaps, we are promoting equitable access to standard treatment by supporting telemedicine initiatives, clinical care pathways, and digital transformation (DX) in healthcare. Additionally, we are regularly updating clinical guidelines to reflect the latest evidence and distributing resources such as the *Treatment Guide for Diabetes*, *The Essence of Diabetes Treatment*, and A consensus statement from the Japan Diabetes Society: A proposed algorithm for pharmacotherapy in people with type 2 diabetes These materials are designed to support not only specialists, but also general practitioners and Certified Diabetes Educators, ultimately improving the quality of diabetes care across all regions of Japan.

Through the three key initiatives presented in this chapter—strengthening clinical infrastructure, promoting standardization of care, and addressing regional disparities—we aim to ensure the sustainable advancement of diabetes care in Japan. These efforts will enable healthcare professionals to receive appropriate compensation and work in supportive environments, while ensuring that people with diabetes can access high-quality care regardless of where they live. For national and local governments, such improvements will contribute to better control of healthcare expenditures and a reduction in the broader societal burden.

By steadily advancing these initiatives, JDS remains firmly committed to supporting the future of diabetes care and creating a society where everyone can receive medical support with confidence and dignity.

IX. Preparing for the Future

Infectious Disease Threats and Diabetes – Responding to Future Pandemics

Introduction

The history of humankind is often described as a history of battling infectious diseases. In recent decades, the world has faced repeated threats from emerging infectious diseases such as SARS in 2002, MERS in 2015, and the COVID-19 pandemic that began in late 2019. Although the spread of COVID-19 has been brought under control through public health measures and widespread vaccination, the risks associated with viral mutations—such as increased transmissibility and severity—remain a concern.

People with diabetes are especially vulnerable in the face of such infectious disease outbreaks. To safeguard their health, it is critical to establish robust preventive strategies and support systems before the next pandemic strikes.

The Link Between Diabetes and Infectious Diseases

(1) How Diabetes Increases Susceptibility to Infections

People with diabetes are at significantly higher risk of developing infections due to several physiological factors, including:

- **Impaired immune function**: Elevated blood glucose levels can reduce the effectiveness of white blood cells such as neutrophils, weakening the body's defense against infections.
- **Poor circulation**: Peripheral vascular dysfunction can diminish local immune responses.
- **Neuropathy**: Diabetic neuropathy may delay the detection of infections.
- **Gut microbiota imbalance**: Changes in intestinal flora and weakened gut barrier function can raise infection risk.

These overlapping factors result in a substantially increased burden of infections among people with diabetes. Compared with the general population, the risk of hospitalization due to bacterial or viral infections is reported to be 2 to 4 times higher, while the risk of outpatient-treated infections is approximately 1.5 times greater.

(2) Diabetes and COVID-19

During the COVID-19 pandemic, people with diabetes showed a markedly higher risk of severe illness. Mortality rates were approximately twice as high as those in the general

population, and between 13% and 58% of ICU admissions involved patients with diabetes. Comorbidities such as obesity, chronic kidney disease, and cardiovascular disease further elevated these risks.

A large-scale study conducted by JDS titled *Causes of Death Among Japanese People with Diabetes: A Questionnaire-Based Survey* (2011–2020, n = 68,555) revealed that while cancer was the leading cause of death among people in their 50s and 60s, infectious diseases became the most common cause in those aged 70 and above. This suggests that as the prevalence of diabetes increases with age, so does vulnerability to infections.

Chronic inflammation—one of the hallmarks of diabetes—may also predispose individuals to excessive immune responses during infections, increasing the likelihood of severe illness. In addition, inflammatory reactions triggered by infections can reduce insulin sensitivity and elevate blood glucose levels, even in people without diabetes, further contributing to adverse outcomes.

Societal Impact of Infectious Diseases and Implications for Diabetes Care

(1) Reduced Access to Medical Care During COVID-19

The COVID-19 pandemic placed enormous strain on healthcare systems, diverting resources toward infection control and leading many individuals with diabetes to postpone or avoid routine medical visits. In 2020, the number of patients receiving diabetes treatment declined by approximately 10.4%, and a rise in HbA1c levels was observed among people with type 2 diabetes. The disruption also affected cancer screening programs, resulting in missed opportunities for early cancer detection.

(2) The Role of Telemedicine

While the pandemic accelerated the adoption of telemedicine, it also brought to light several challenges. Reduced face-to-face consultations raised concerns about the quality of care, including limitations in conducting routine physical exams and laboratory tests. These issues will likely remain critical considerations in future pandemic preparedness and healthcare planning.

Preparing for Future Pandemics

As discussed in earlier sections, people with diabetes face a higher risk of severe illness from infectious diseases and are particularly vulnerable to disruptions in medical access and daily routines. Based on these challenges, this section outlines key strategies and policy directions to strengthen preparedness for future pandemics.

(1) Strategies to Reduce Infection Risk

To minimize infection risk among people with diabetes, the following measures are essential:

- **Promotion of vaccinations** (e.g., for influenza, pneumococcal disease, and COVID-19)
- **Proper glycemic control**, as hyperglycemia is a known factor in worsening infections
- **Strict adherence to basic infection prevention practices** (hand hygiene, mask use, avoiding poorly ventilated spaces)
- **Enhanced sick-day management**, including individualized plans for infection-related care

In 2021, JDS and JADEC jointly issued a call to "Reinforce Sick-Day Preparedness," emphasizing the importance of ongoing communication with primary care providers—even in non-emergency times.

(2) Strengthening the Healthcare System

To prepare for future pandemics, healthcare systems must enhance both their structural capacity and infection control measures. In 2024, Japan's Ministry of Health, Labour and Welfare released a *Government Action Plan for Pandemic Influenza and New Infectious Diseases*, which called for a flexible healthcare infrastructure capable of responding to multiple waves of infection.

To ensure uninterrupted and appropriate care for people with diabetes, the plan highlights the importance of differentiated roles among healthcare facilities, proactive use of telemedicine during non-emergency periods, and strengthened coordination with community health resources. A flexible and adaptive system is essential to meet the realities of future crises.

Infection Control and Diabetes Care During Disasters

In 2024, JDS and JADEC jointly published the *Manual for Disaster Diabetes Care 2024*, outlining essential strategies to support people with diabetes during emergencies. The manual identifies three key pillars common to both disaster and infectious disease preparedness:

- **Preparedness during normal times** (blood glucose management and care coordination)
- **Education and awareness** (infection prevention behaviors and understanding patients' needs)
- **Medical support during disasters or outbreaks** (individualized care and continuity of treatment)

Living in evacuation settings poses multiple infection risks for people with diabetes due to sudden changes in their environment and limited access to medical resources. Specific risks include:

- Increased exposure to infections due to abrupt lifestyle changes
- Immune suppression caused by hyperglycemia
- Heightened infection risks from vascular and neuropathic complications
- Higher incidence of urinary tract infections due to limited toilet and bathing access
- Increased risk of infection at injection sites
- Greater vulnerability to outbreaks in crowded shelters

To reduce these risks, it is critical to build medical support systems that ensure people with diabetes can receive appropriate care during disasters—as well as to promote proactive preparedness during non-emergency periods.

Conclusion

For people with diabetes, infectious diseases pose a serious and persistent threat. In an era where the risk of emerging and re-emerging infections is increasing, daily blood glucose management and infection prevention practices are more essential than ever. Healthcare institutions must be equipped to continue care during pandemics, expand their use of telemedicine, and strengthen their ability to respond in times of disaster.

JDS remains committed to developing infection control guidelines and disaster response strategies to ensure that people with diabetes have continued access to care in any circumstance.

The initiatives outlined in this 5th Five-Year Strategic Plan—advancing research, nurturing talent, strengthening healthcare systems, and building partnerships with society—form the foundation not only of day-to-day diabetes care, but also of a resilient system that can adapt in times of crisis. By steadily advancing these efforts, we can help safeguard the health and well-being of people living with diabetes.

We hope that each of the proposals and initiatives presented here will be put into action and shared widely—across communities, professions, and regions.

Toward a society where everyone can live well with diabetes.
JDS will continue to move forward—together with all those who share this vision.