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**Research Article**

# Feasibility Study of Precision Longevity as an Innovation in Locus Medical Hub Services

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## ABSTRACT

Advances in healthcare technology and the growing public demand for personalized, preventive, and technology-based services are driving the transformation of modern healthcare models. One emerging concept is the medical hub, an integrated outpatient specialty care center that combines various medical services into a single comprehensive system. The integration of precision medicine, longevity medicine, and multidisciplinary care is becoming an increasingly common approach to support disease prevention and improve quality of life.This study aims to develop a model for an Integrated Precision and Longevity Medical Center at the Locus Medical Hub Clinic as an innovation in precision medicine-based healthcare services. The study employed a descriptive approach through literature review, health service needs analysis, and a review of the concept of modern medical service integration. The developed model includes a precision diagnostic unit, a longevity and healthy aging unit, a regenerative medicine unit, a lifestyle medicine unit, and a multidisciplinary complex case clinic. The results indicate that the proposed model has the potential to enhance healthcare service effectiveness through precision diagnostics, a multidisciplinary approach, and chronic disease prevention strategies. In addition, the model may improve service efficiency through collaboration among specialists and the utilization of modern health technologies. The Integrated Precision and Longevity Medical Center model has the potential to become an innovative, integrated, and adaptive healthcare service model that responds to advances in medical technology and future healthcare needs.

**Keywords** : Medical Hub, Precision Medicine, Longevity Medicine, Healthcare Innovation.

## ABSTRAK

*Perkembangan teknologi kesehatan dan meningkatnya kebutuhan masyarakat terhadap layanan yang personal, preventif, dan berbasis teknologi mendorong transformasi model pelayanan kesehatan modern. Salah satu konsep yang berkembang adalah medical hub, yaitu pusat layanan spesialis rawat jalan terpadu yang mengintegrasikan berbagai layanan medis dalam satu sistem yang komprehensif. Integrasi precision medicine, longevity medicine, dan pelayanan multidisiplin menjadi pendekatan yang semakin banyak diterapkan untuk mendukung pencegahan penyakit dan peningkatan kualitas hidup. Penelitian ini bertujuan mengembangkan model Integrated Precision and Longevity Medical Center pada Klinik Locus Medical Hub sebagai inovasi pelayanan kesehatan berbasis kedokteran presisi. Penelitian menggunakan pendekatan deskriptif melalui analisis literatur, analisis kebutuhan layanan kesehatan, dan kajian konsep integrasi layanan medis modern. Model yang*

*dikembangkan mencakup precision diagnostic unit, longevity and healthy aging unit, regenerative medicine unit, lifestyle medicine unit, serta multidisciplinary complex case clinic.Hasil kajian menunjukkan bahwa model ini berpotensi meningkatkan efektivitas layanan melalui diagnosis presisi, pendekatan multidisiplin, dan pencegahan penyakit kronis. Selain itu, model ini juga berpotensi meningkatkan efisiensi pelayanan melalui kolaborasi antarspesialis dan pemanfaatan teknologi kesehatan modern. Integrated Precision and Longevity Medical Center pada Klinik Locus Medical Hub berpotensi menjadi model inovasi pelayanan kesehatan yang terintegrasi, adaptif, dan mampu menjawab kebutuhan pelayanan kesehatan di masa depan.*

**Kata Kunci** : *Pusat layanan kesehatan, pengobatan presisi, pengobatan untuk umur panjang, inovasi dalam layanan kesehatan.*
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## INTRODUCTION

Advances in health technology in recent years have driven a paradigm shift in healthcare from a conventional approach to more personalized, preventive, and technology-based healthcare. One approach that has developed in modern healthcare systems is precision medicine, which is a medical approach that tailors prevention, diagnosis, and therapy based on individual patient characteristics such as genetic profile, environment, and lifestyle. This approach is considered capable of improving the effectiveness of therapy and enhancing the overall quality of healthcare services.

Research by (Johnson, 2021) shows that the integration of digital technologies such as artificial intelligence into healthcare systems can improve diagnostic accuracy and assist in more effective clinical decision-making. Furthermore, research by (Stenzinger et al., 2023) explains that the development of genomic technology and targeted therapy are important components in the implementation of precision medicine in modern clinical practice. In addition, research by (Mezzalira et al., 2024) shows that a healthcare model integrated with a multidisciplinary approach can improve the quality of healthcare services and support more effective management of chronic diseases.

On the other hand, the concept of longevity medicine is also developing as a healthcare approach that focuses on disease prevention and improving long-term quality of life. This approach emphasizes the importance of early detection of disease risks, healthy lifestyle management, and continuous health monitoring. (Vallée's, 2024) research shows that the integration of digital technology and preventive health approaches can support the development of a more personalized and patient-oriented healthcare system.

In the context of healthcare in Indonesia, the development of modern healthcare models has begun to be implemented in several healthcare facilities, including integrated specialist clinics. Locus Medical Hub Clinic is one such healthcare facility that has developed an integrated specialist-based healthcare concept aimed at providing more integrated healthcare services oriented towards patient needs.

However, the integration of precision medicine and longevity medicine concepts into the healthcare system at clinics is still limited and has not been systematically developed into an integrated healthcare model. Therefore, a healthcare model is needed that can integrate

various modern medical approaches into an effective and comprehensive healthcare system.

This study aims to develop an Integrated Precision and Longevity Medical Center model at the Locus Medical Hub Clinic as a precision medicine-based healthcare innovation that is expected to improve the quality of healthcare services and support the development of a modern healthcare system.

## METHODS

This study uses a qualitative descriptive approach with a health service model development method. The study was conducted by analyzing modern health service concepts that can be applied to the health service system at the Locus Medical Hub Clinic.

Research data was obtained through a literature study of various scientific sources related to precision medicine, longevity medicine, and the concept of modern health service integration. In addition, an analysis was conducted on the needs for health service development that could potentially be applied at the Locus Medical Hub Clinic.

The research stages included identifying modern healthcare concepts, analyzing service components that could be integrated into the clinic's service system, and developing an Integrated Precision and Longevity Medical Center service model that could be applied at the Locus Medical Hub.

## RESULT AND DISCUSSION

The results of the study show that the development of an Integrated Precision and Longevity Medical Center in a medical hub clinic can be achieved through the integration of several interconnected health service units. This service model is designed to improve the quality of health services through a multidisciplinary approach, precision diagnosis, and chronic disease prevention strategies.

**Table 1.** Service Components of the Integrated Precision and Longevity Medical Center

| Service Unit | Role in Service Delivery | Objective |
|---|---|---|
| Precision Diagnostic Unit | Diagnosis based on advanced technologies such as genomics, biomarkers, and AI | Improve diagnostic accuracy |
| Longevity & Healthy Aging Unit | Disease prevention programs and quality of life improvement | Supporting long-term health |
| Regenerative Medicine Unit | Regenerative therapies such as PRP and cell therapy | Repairing body tissues |
| Lifestyle Medicine Unit | Healthy lifestyle management and chronic disease prevention | Reducing disease risk |
| Multidisciplinary Complex Case Clinic | Collaboration among specialists in handling complex cases | Improving the quality of clinical decision-making |

The results of the study show that the Integrated Precision and Longevity Medical Center model at the Locus Medical Hub Clinic consists of five main service units that are integrated with each other, namely the Precision Diagnostic Unit, Longevity and Healthy Aging Unit, Regenerative Medicine Unit, Lifestyle Medicine Unit, and Multidisciplinary

Complex Case Clinic. This service structure is designed to support a more personalized, preventive, and technology-based approach to healthcare.

As shown in Table 1, each service unit has a specific function in the healthcare system. The Precision Diagnostic Unit serves as the initial stage in the service process by identifying patients' health conditions using modern diagnostic technology and clinical data analysis. Furthermore, the Longevity and Healthy Aging Unit focuses on preventive health programs aimed at improving patients' long-term quality of life. Meanwhile, the Regenerative Medicine Unit provides regenerative therapies that support tissue repair and organ function recovery.

In addition, the Lifestyle Medicine Unit plays a role in managing disease risk factors through healthy lifestyle interventions, while the Multidisciplinary Complex Case Clinic provides cross-specialist consultation services for the treatment of complex medical cases. The integration of these various service units enables patients to receive more comprehensive healthcare services within a single integrated service system.

**Table 2.** The Role of Each Unit in the Integrated Service System

| Service Unit | Role in Service Delivery |
|---|---|
| Precision Diagnostics | Identifying disease risks early on |
| Longevity Medicine | Developing long-term health strategies |
| Regenerative Medicine | Supporting tissue repair therapies |
| Lifestyle Medicine | Managing disease risk factors |
| Multidisciplinary Clinic | Providing cross-specialty consultations |

Based on Table 2, each service unit has a complementary role in the integrated healthcare system at the Locus Medical Hub Clinic. The Precision Diagnostic Unit functions to identify disease risks early through a precision diagnosis approach. The results of these diagnoses then form the basis for determining healthcare strategies appropriate to the patient's condition.

Furthermore, the Longevity Medicine Unit plays a role in designing long-term health strategies through disease prevention programs and regular health monitoring. The Regenerative Medicine Unit supports therapeutic processes aimed at repairing damaged body tissues. Meanwhile, the Lifestyle Medicine Unit focuses on managing disease risk factors through healthy lifestyle changes.

This integrated healthcare approach enables more effective coordination of services between service units and supports more comprehensive clinical decision-making through a multidisciplinary approach.

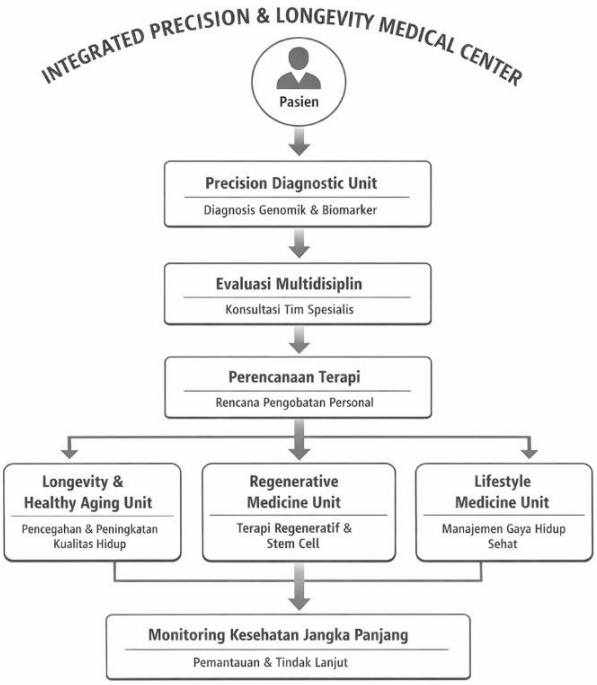


**Figure 1.** Integrated Service Model

The healthcare service flow in the Integrated Precision and Longevity Medical Center model can be seen in the service model diagram, which shows the stages of healthcare services at the Locus Medical Hub Clinic. The service process begins with an initial examination through the Precision Diagnostic Unit to identify the patient's overall health condition.

Next, the examination results will be evaluated by a multidisciplinary team to determine a healthcare plan that is appropriate for the patient's condition. Based on the results of this evaluation, patients can be directed to undergo available healthcare programs, such as longevity medicine services, regenerative therapy, and healthy lifestyle management programs.

The final stage in this service model is continuous health monitoring, which aims to ensure the effectiveness of medical interventions and improve the patient's quality of life in the long term. Thus, this service model enables the creation of a more integrated, effective, and patient-centered healthcare system.

The development of the Integrated Precision and Longevity Medical Center model at the Locus Medical Hub Clinic shows that integrating precision medicine, longevity medicine, and a multidisciplinary approach can be an innovative strategy for improving healthcare quality. This model emphasizes a more personalized, preventive, and clinically data-driven approach to care, enabling more comprehensive patient management.

The results of this study show that the Precision Diagnostic Unit is an important component in modern healthcare systems because it enables more accurate identification of disease risks through the use of diagnostic technology and analysis of patient clinical data. This approach is in line with the concept of precision medicine, which emphasizes the adjustment of diagnosis and therapy based on the characteristics of individual patients.

Several previous studies have shown that the application of precision diagnosis can increase the effectiveness of therapy and support more accurate clinical decision-making.

In addition, the integration of the Longevity and Healthy Aging Unit into this service model strengthens a healthcare approach that focuses on disease prevention and improving long-term quality of life. This approach is becoming increasingly relevant with the rising prevalence of chronic diseases such as cardiovascular disease, diabetes, and metabolic disorders that require prevention-based healthcare strategies.

The Lifestyle Medicine Unit also plays an important role in managing disease risk factors through healthy lifestyle interventions such as diet, physical activity, and stress management. The integration of these services allows patients to receive a more comprehensive healthcare approach that focuses not only on treating disease but also on prevention and health maintenance.

In addition, the Regenerative Medicine Unit provides opportunities for the development of innovative medical therapies that support the body's tissue repair processes and improve organ function through a regenerative therapy approach. Meanwhile, the Multidisciplinary Complex Case Clinic enables collaboration between specialists in handling complex medical cases, thereby improving the quality of clinical decision-making and the effectiveness of patient care.

The implementation of an integrated healthcare service model at the Locus Medical Hub Clinic also has the potential to improve service efficiency through better coordination between service units and the optimization of medical resource utilization. Thus, the Integrated Precision and Longevity Medical Center model can be one of the healthcare service innovations that supports the transformation of the modern healthcare system towards more personalized, preventive, and technology-based services.

## CONCLUSION

This study shows that the development of the Integrated Precision and Longevity Medical Center model at the Locus Medical Hub Clinic has the potential to be an innovation in the modern healthcare system. This model integrates several key service units, namely the Precision Diagnostic Unit, Longevity and Healthy Aging Unit, Regenerative Medicine Unit, Lifestyle Medicine Unit, and Multidisciplinary Complex Case Clinic, which are designed to support a more personalized, preventive, and technology-based approach to healthcare.

The integration of these various service units enables improved healthcare effectiveness through precision diagnosis, multidisciplinary collaboration, and chronic disease prevention strategies oriented towards improving patient quality of life. In addition, the implementation of this service model at the Locus Medical Hub Clinic also has the potential to improve healthcare efficiency through coordination between specialists and optimization of the use of modern health technology.

Overall, the Integrated Precision and Longevity Medical Center model can be an alternative innovation in healthcare services that is adaptive to developments in medical technology and future healthcare needs. The implementation of this model is expected to support the development of a more integrated, effective, and patient-oriented healthcare system.

**REFERENCES**

Ashley, E. A. (2021). The precision medicine initiative: A new national effort. *JAMA*, 325(21), 2119–2120. https://doi.org/10.1001/jama.2021.4260

Bayer, R., Galea, S., & Galea, S. (2021). Public health and precision medicine: Bridging the gap. *American Journal of Public Health*, 111(2), 208–210. https://doi.org/10.2105/AJPH.2020.306034

Chen, J., Liu, Y., & Guo, X. (2022). Artificial intelligence in precision medicine: A systematic review. *Healthcare*, 10(6), 1082. https://doi.org/10.3390/healthcare10061082

Ginsburg, G. S., & Phillips, K. A. (2018). Precision medicine: From science to value. *Health Affairs*, 37(5), 694–701. https://doi.org/10.1377/hlthaff.2017.1624

Hood, L., & Price, N. D. (2021). Demystifying disease, democratizing health care. *Science Translational Medicine*, 13(577), eabd8023. https://doi.org/10.1126/scitranslmed.abd8023

Johnson, K. B., Wei, W. Q., Weeraratne, D., et al. (2021). Precision medicine, AI, and the future of personalized healthcare. *npj Digital Medicine*, 4(1), 1–8. https://doi.org/10.1038/s41746-021-00426-3

Khoury, M. J., Bowen, M. S., Dotson, W. D., et al. (2018). Precision medicine and public health: The importance of implementation research. *Public Health Genomics*, 21(3–4), 151–156. https://doi.org/10.1159/000497262

Longo, V. D., Antebi, A., Bartke, A., et al. (2021). Interventions to slow aging in humans: Are we ready? *Aging Cell*, 20(2), e13303. https://doi.org/10.1111/acel.13303

Mezzalira, S., Simões, P., & Ribeiro, R. (2024). Integrated care models and multidisciplinary approaches in modern healthcare systems. *Healthcare*, 12(3), 412. https://doi.org/10.3390/healthcare12030412

National Research Council. (2011). Toward precision medicine: Building a knowledge network for biomedical research and a new taxonomy of disease. *National Academies Press*. https://doi.org/10.17226/13284

Naylor, M. D., & Kurtzman, E. T. (2020). The role of integrated care in improving healthcare outcomes. *Health Affairs*, 39(11), 1885–1891. https://doi.org/10.1377/hlthaff.2020.00973

Obermeyer, Z., & Emanuel, E. J. (2016). Predicting the future — Big data, machine learning, and clinical medicine. *New England Journal of Medicine*, 375, 1216–1219. https://doi.org/10.1056/NEJMp1606181

Porter, M. E., & Lee, T. H. (2013). The strategy that will fix health care. *Harvard Business Review*, 91(10), 50–70. https://doi.org/10.1007/978-3-319-44615-8_10

Price, N. D., & Hood, L. (2020). Systems biology and personalized medicine. *Nature Biotechnology*, 38(8), 920–922. https://doi.org/10.1038/s41587-020-0605-7

Schleidgen, S., Klingler, C., Bertram, T., et al. (2013). What is personalized medicine? *BMC Medical Ethics*, 14(1), 55. https://doi.org/10.1186/1472-6939-14-55

Stenzinger, A., Allen, J. D., Maas, J., et al. (2023). Implementing precision medicine in

clinical practice: Challenges and opportunities. *Journal of Internal Medicine*, 293(5), 549–564. https://doi.org/10.1111/joim.13698

Topol, E. (2019). High-performance medicine: The convergence of human and artificial intelligence. *Nature Medicine*, 25(1), 44–56. https://doi.org/10.1038/s41591-018-0300-7

Vallée, A. (2024). Digital health and patient-centered care: Transforming healthcare delivery through technology. *Journal of Medical Internet Research*, 26, e50204. https://doi.org/10.2196/50204

Waldman, S. A., & Terzic, A. (2019). Clinical and translational science and precision medicine. *Clinical and Translational Science*, 12(1), 4–8. https://doi.org/10.1111/cts.12593

World Health Organization. (2021). Global strategy on digital health 2020–2025. *WHO*. https://doi.org/10.4060/9789240020924

Zeggini, E., Gloyn, A. L., Barton, A. C., et al. (2019). Translational genomics and precision medicine. *Nature Reviews Genetics*, 20(12), 681–697. https://doi.org/10.1038/s41576-019-0158-9

Zhou, J., Wang, F., Hu, J., et al. (2021). Deep learning for healthcare: Review, opportunities and challenges. *Briefings in Bioinformatics*, 22(1), 1–15. https://doi.org/10.1093/bib/bbz135

ZonMw. (2020). Personalized medicine and healthcare innovation. *Journal of Personalized Medicine*, 10(3), 112. https://doi.org/10.3390/jpm10030112