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Blood Supply Chain Monitoring System using ICP Blockchain

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Abstract: *The safe and transparent management of donated blood is a critical aspect of modern healthcare infrastructure. However, traditional centralized systems often suffer from issues like lack of traceability, risk of data tampering, and the proliferation of unauthorized blood banks, leading to serious health hazards. In this project, we present the* ***Blood Supply Chain Monitoring System using ICP Blockchain****, a decentralized application (DApp) designed to monitor the complete journey of blood units — from donation to transfusion or disposal. Our platform registers authorized blood banks, hospitals, and patients, enabling a designated staff member to record and track the movement of each blood packet, uniquely identified with a traceable ID. Built on the Internet Computer (IC) blockchain, the system ensures immutability, public auditability, and cost-efficiency, addressing the alarming issues of fake blood supply and illegal market practices. By leveraging the transparency of Web3 technologies, our solution provides a global, tamper-proof, and highly scalable blood management system that could significantly reduce the risk of disease transmission from contaminated blood, enhance public trust, and help eradicate unauthorized blood banks. Comparative insights drawn from recent blockchain-based healthcare systems further validate the relevance and urgency of our proposed solution.*

Keywords: Blood Supply Chain, Blockchain Technology, Internet Computer Protocol (ICP), Blood Donation Monitoring, Decentralized Application (DApp), Blood Bank Authorization, Blood Inventory Management, Web3 Healthcare Solutions, Data Immutability, Blood Traceability

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