

REQUIREMENT SPECIFICATION

TITLE: REQUEST FOR PROPOSAL FOR THE IMPLEMENTATION, HOSTING AND SUPPORT OF A CLINICAL MANAGEMENT SYSTEM

1. Introduction

- 1.1 The National Kidney Foundation (“**NKF**”) wishes to appoint service provider (the “**Contractor**”) for the implementation, hosting and support of a Clinical Management System (“**System**”). This is to upgrade, enhance and migrate the existing system that is currently on Microsoft Dynamics CRM 2015 platform.

2. Scope of Service

- 2.1 The Contractor shall perform the Services according to the requirements specified in **Annex A to L**, as according to their submission of bid(s) in the **Price Schedule**.

3. Demonstration of Capabilities

- 3.1 Contractor shall at their own expense, at the written request of NKF, prepare and conduct demonstrations/presentations in Singapore to substantiate the claims and proposals in their quotations. The time, date and venue for any such demonstrations/presentations shall be determined by NKF. The demonstration of the software and hardware, etc. if required, will have to be arranged within 3 days by Contractor.

4. RFP Briefing

- 4.1 Vendors are required to attend a **compulsory briefing** (either personally or through a company’s representative) which will be conducted as follows:
- Date:** 23 October 2024, Wednesday
Time: 9.30 am
Venue: NKF Centre, 81 Kim Keat Road, Singapore 328836
- 4.2 To participate in the online briefing session, Vendors have to email to raymond.thong@nkfs.org with details on the company’s name, attendee’s name and email address by **22 October 2024, Tuesday, 10.00am**. The meeting details would be emailed to Vendors who had expressed their interest to attend.
- 4.3 NKF has the discretion to decide if the RFP bids submitted by Vendor who did not attend the briefing session should be considered.
- 4.4 It is recommended for vendor to involve PowerApps/CRM consultants during the briefing, as NKF IT will demonstrate the current system to showcase key features that are important to be port over to new platform.

5. Submission of RFP Bids

- 5.1 Each Vendor should provide the price quote in the Price Schedule as according to the proposed system submitted.
- 5.2 All quotations submitted by Contractor must indicate the prices applicable for the requirement specification in paragraph 2.1 above
- 5.3 Contractor, at the point of submission of its bids, is required to provide the following information and/or documents to NKF:
 - 5.3.1 Annex A to L including attachment(s)
 - 5.3.2 Certificate of security test and Vulnerability Assessment and Penetration Test (VAPT) or equivalent documents to showcase the reliability of the proposed system wherever possible;
 - 5.3.3 Any other documents relevant to the RFP.

ANNEX A

SCOPE OF WORK

We are opening this RFP to interested Contractors for their participation.

Refer to the following Annexes for more information:

- Annex A:** Scope of Work
- Annex B:** Technical Requirements
- Annex C:** Functional Requirements (Submit attachment(s) in both hard copy and thumb drive.)
- Annex D:** Support Requirements
- Annex E:** High Level Project Plan
- Annex F:** Contractor's Experiences in Similar Projects
- Annex G:** Team Composition
- Annex H:** Project Requirement Compliances
- Annex I:** System Architecture Diagram
- Annex J:** List of Licence Agreements
- Annex K:** Mock up Screens
- Annex L:** Third Party Evaluation Form

1. PROJECT BRIEF & INFORMATION

- 1.1. NKF is calling for a RFP for the upgrade, enhancement and migration of our existing Microsoft Dynamics CRM 2015 to the latest on-cloud Microsoft PowerApps platform.
- 1.2. Objective: To implement System on a secured cloud to be accessible to NKF and its authorised representatives only. The registered personnel shall access within Singapore, via NKF network/VPN.
- 1.3. This on-cloud System is to replace the existing on-premise Clinical system that is running on Microsoft Dynamics CRM 2015 at NKF Centre.

2. GENERAL REQUIREMENTS

- 2.1. System to be hosted at a secured and auditable facility certified to the security and Vulnerability Assessment and Penetration Test (VAPT) standards of both NKF and Singapore authorities. Contractor is responsible to ensure the system undergoes routine security and VAPT certification on System annually. Such proof of certification shall be provided to NKF annually or at any time upon request. For SAAS, the SOC report (or similar), including bridging letters to be available for the purpose of annual audit.
- 2.2. Contractor shall provide all the required equipment and services, whether explicitly mentioned in these specifications or not, to fulfil the intent of the specification and to ensure the completeness, operation and maintainability of the system at no extra cost to NKF.
- 2.3. Contractor is responsible for any damage found during the course of installation. Contractor is required to rectify and reinstate the damage back to the working state prior to the damage. NKF will not entertain any additional cost related to the above.

- 2.4. Day works are allowed provided the works do not generate excessive noise, dust and/or do not cause any inconveniences to the patients, NKF staff, residents or the general public, subject to the approval of NKF. NKF also reserves the right, at any time of the day, to stop any works that are deemed unfavourable to patient care or public safety. No claims shall be entertained for expenses arising from compliance with this clause.
- 2.5. All costs incurred from the coordination and liaison works between Contractor and all term contactors, specialist contractors and integrators are deemed to be included in the contract price.
- 2.6. Contractor shall submit together with the RFP:
 - 2.6.1. Description of the software, hardware and its components as offered together with all relevant manufacturers' catalogues illustrations and diagrams. All relevant technical and descriptive literature shall be in English. Literature shall be sufficient to prove the software, hardware and its components on offer fully complies with the specification listed below.
 - 2.6.2. Contractor shall guarantee all software, hardware and its components being offered for the period of the contract against fault and loss and on the operation of System as a whole. Contractor shall also guarantee the support and maintenance of System following the award of the contract for as long as the contract is valid.
- 2.7. Contractor shall highlight and update NKF of any new or special functionality that are useful and relevant to NKF but not found in any part of this RFP.
- 2.8. It shall be in the scope of Contractor to acquire any requisite authorisations or licensing from local authorities, where applicable, that may be required in the course of the project.
- 2.9. Installation and commissioning of System on cloud with full redundancy and scalability support.
- 2.10. Installation and commissioning of the required access software or portal addresses on all NKF client workstations and devices.
- 2.11. Inclusion of system backup solutions to address NKF retention policies and in the event of data centre outage.

3. PROJECT SCHEDULE

- 3.1. The selected Contractor would be required to complete the supply, delivery, commissioning and maintenance of System accessible at NKF Centre, Integrated Renal Centre, and all dialysis centres according to the schedule listed in Annex E.
- 3.2. Contractor is however permitted to state an alternate timeline and indicate the reasons they wish to offer for such alternative schedule. **All existing functionalities (core functions to support operation) must be completed by end December 2025. Optional components can be completed by end June 2026.**

- 3.3. Contractor to be awarded: Implementation year (termed Year 0) which shall include 4 months warranty; Maintenance period of Three (3) firmed years (termed Year 1-3). Contractor to include an additional One (1) year of maintenance as Option (termed Year 4).
- 3.4. Note some components (eg. license) may be awarded in parts.

4. INSPECTION, TESTING AND COMMISSIONING

- 4.1. On completion of installation, all the equipment and installation shall be inspected jointly by NKF and the Contractor for their correctness and completeness at the site of installation during acceptance.
- 4.2. The Contractor shall ensure that before the completion of the installation, delivery of all documentations to NKF in soft copy forms; and/or in hard copy forms if required (eg. during training).
- 4.3. Any other tests, as NKF may deem fit so as to confirm the performance or to establish the compliance to technical specifications of either individual software items or integrated operation of System shall be conducted by the Contractor on site. Should the results of these tests show any deficiency or deviation to specifications, the Contractor shall do whatever modification, replacement, addition necessary to make System compliant to the specification at own cost.

5. TRAINING

- 5.1. Training shall be offered to all users selected by NKF.
- 5.2. The methodology of the training shall be developed based on the Contractor's experience in the design, construction, operation and maintenance of System.
- 5.3. The basic structure of the training shall include, as a minimum:
- 5.3.1. Operation and maintenance of the complete System.
 - 5.3.2. Field training on site.
 - 5.3.3. Training shall be conducted in English.
 - 5.3.4. Training and/or User Guide (softcopy) in English.

Accepted By:

Authorized Signature:	_____	Date:	_____
Signatory's Name:	_____	Signatory's Title:	_____
Telephone Number:	_____	Contractor's Name:	_____
Email Address:	_____	Contractor's Stamp:	_____

ANNEX B**TECHNICAL REQUIREMENTS****1. GENERAL REQUIREMENTS**

- 1.1. Contractor shall be responsible for the successful implementation, commission and effective operations of System including integration activities with all software and hardware components and external systems (e.g. government systems). Contractor shall involve NKF's representatives in all phases of the project life-cycle, including all project meetings and reviews of all project deliverables. **Collaboration is expected during design phase to ensure designs leverage on NKF IT teams' domain knowledge/expertise.**
- 1.2. Contractor's responsibilities shall include at least the following:
 - 1.2.1. Resolve all hardware, software, network and all other related problems;
 - 1.2.2. Manage all matters relating to the delivery, installation and operation of System, including hardware, software, system interfaces, documentation, procedures, and briefings;
 - 1.2.3. Be responsible for capacity sizing, system architecture, configuration and overall performance of System, and;
 - 1.2.4. Ensure any impact on system interfaces are minimised in the context of application changes and system configuration of the system interfaces.
- 1.3. Referring to 1.2.3 on sizing, our current CRM database is 323GB, our scanned document for Administration is 613GB, our scanned document for Clinical is 632GB. Contractor to indicate in Price Schedule, based on our required license volume, the entitled storage and the additional storage cost required.
- 1.4. System shall be compatible at least with the Operating System (OS), Microsoft Office and browser versions as follows:
 - 1.4.1. Windows 11 OS and above (64-bits);
 - 1.4.2. Microsoft Office 365;
 - 1.4.3. Microsoft Edge web browser (Chromium)
 - 1.4.4. iOS and iPad OS
- 1.5. System shall be mobile friendly where applicable (eg. to support doctor access via ipad). Native mobile app (eg. PowerApps mobile app) to be leveraged if possible.

2. HOSTING ENVIRONMENT

- 2.1 System must be hosted on a cloud based in Singapore. If the host is not based in Singapore, Contractor is to fully assure and warrant the security of NKF data. Contractor will be fully and solely responsible for any data breaches or losses. Any cost and effort incurred to fix these inadequacies and recover/secure data are fully and solely responsible by Contractor.
- 2.2 System must be accessible from the internet (external eg. through VPN) and intranet (internal) for operation and maintenance. System must support the limitation of access to only traffic allowable by NKF, that is, traffic from NKF HQ (including through VPN to HQ) and Dialysis Centres **only**. Staffs at overseas can only access the system through NKF VPN.

- 2.3 Contractor shall liaise and work with NKF appointed representatives for the setup, implementation and support of System.
- 2.4 Contractor to propose architecture showcasing how sensitive medical data are protected from cyber attacks.
- 2.5 Contractor shall be responsible for the installation and configuration of all software product and tools required for the implementation of System. Contractor shall work with all NKF appointed representatives to ensure successful installation and configuration in the NKF environment for System.
- 2.6 Contractor shall provide detailed costing for the hardware and software components that is required for System (total cost of ownership).
- 2.7 Contractor is fully and wholly responsible for conducting security and Vulnerability Assessment and Penetration Test (VAPT) certification on System annually. Such proof of certification shall be provided to NKF annually or at any time upon request. In the case of SAAS, to support provisioning of SOC reports and bridging letters when requested. In the event that additional Penetration Test is conducted by NKF, Contractor shall fix the findings at no additional cost.
- 2.8 In the case of SAAS, contractor shall provide details and costing of additional cloud hosting required for integration (eg. staging server for data integration with external agencies), if required by the proposed architecture. Contractor to indicate such component/design viz the architecture diagram.
- 2.9 System must leverage on NKF's existing Office365/ADFS authentication to achieve single-sign-on. System must enable multi-factor authentication (In the case of single-sign on, NKF's existing authentication is already multi-factor).
- 2.10 For development environment, contractor to setup at their end. Contractor to factor in all cost/effort for this environment into implementation and maintenance cost. NKF currently have Microsoft Power Apps for Developer licenses.
- 2.11 For Test(UAT) environment, contractor to provide and include any extra cost required including setup and maintenance. This environment must be separated from the production environment, meaning: users or test users granted to this environment must not automatically be able to access production; this environment's downtime and/or performance must not affect production environment. Contractor to include the total cost of this environment as option for NKF to review/exercise.

3. HARDWARE REQUIREMENTS

3.1 GENERAL REQUIREMENTS

- 3.1.1 Contractor must provide NKF with the list and specifications of the hardware needed to support the operation of System viz. the computers, portable devices etc.

3.2 LOG RETENTION

- 3.2.1 System shall support an unrestricted number of audit logs and historical transactions. Such logs are secured and only accessible by NKF and its appointed representatives.

3.3 GROWTH AND FUTURE REQUIREMENTS

- 3.3.1 System shall be upgradeable and scalable in terms of hardware and software to support future growth.
- 3.3.2 The performance and availability of System as per this RFP Contract shall continue to be met notwithstanding System upgrades.
- 3.3.3 Contractor shall ensure that System is sized to meet the targeted user base and projected growth.
- 3.3.4 Contractor shall specify in its proposal all the assumptions made in relation to its estimation.

3.4 COMPATIBILITY

- 3.4.1 Contractor shall be responsible to ensure System is able to work with existing hardware, software and portable devices.

4 SOFTWARE REQUIREMENTS

4.1 GENERAL REQUIREMENTS

- 4.1.1 Contractor shall propose a suite of system software products that is required in the production environment.
- 4.1.2 Contractor shall also ensure patches, upgrades etc of future releases for any software utilised by System is done at no cost to NKF which shall include at least impact analysis, compatibility testing, training and installation.
- 4.1.3 Contractor that propose PowerBI for reporting to note that NKF is already using PowerBI. Contractor is required to review/integrate with our existing PowerBI platform.

5 SYSTEM DELIVERY AND INSTALLATION

5.1 GENERAL REQUIREMENTS

- 5.1.1 Contractor shall assume responsibility for the overall delivery and installation and its eventual implementation to NKF accessing the System.
- 5.1.2 Contractor shall supply a detailed implementation plan and assume responsibility for the overall implementation of System. Contractor shall provide NKF with the implementation strategy and approach.

- 5.1.3 Contractor shall be solely responsible for the end-to-end installation and implementation.
- 5.1.4 Contractor shall provide advice on all matters pertaining to the installation and operation of System, including at least data communication, performance tuning, integration, archiving and backup.
- 5.1.5 Contractor shall provide on-site qualified and competent personnel with relevant experience to co-ordinate all work involved and to liaise with other Contractors when necessary to ensure the successful implementation of System. Contractor's offshore resource should be transparent to NKF (ie. NKF should not be liaising directly with offshore team). Same condition applies during maintenance stage.
- 5.1.6 Contractor with offshore development team shall ensure no impact to NKF in terms of time zone, non-Singapore public holidays, language barrier etc. Impact in this context refers to delivery timelines, understanding of requirement, and support SLA. Contractor to avoid multiple offshore locations whereby the same project's resources are scattered in different regions.
- 5.1.7 Contractor should include at least one consultant with finance background. Refer to attachment C1 for details on customization relating to patient billing which includes posting to ledger within CRM.
- 5.1.8 All key meetings, UAT and training involving users to be face to face. Virtual meetings or emails can be used for clarifications/follow-up/update only. Training to be recorded for users' future self-training or refresher.
- 5.1.9 Contractor shall package the final solution to include all necessary deliverables such as executable, source codes, documentation, for installations to be carried out by NKF.
- 5.1.10 Contractor to highlight if any license needs to be turn on early at development phase.
- 5.1.11 System should minimise dependencies on any client software where possible. In the event that client installation is inevitably required, Contractor shall introduce process to ensure that the client software is properly installed in the identified users' clients.
- 5.1.12 System should minimise dependencies on any third-party software/library where possible. In the event that third-party software/library is inevitably required, Contractor shall include the cost with clear purchase requirement*. (*Eg. can the cost be part of this contract or NKF need to separately buy the license.)
- 5.1.13 Contractor should ensure any client software installed for use shall be intuitive. For example, no additional settings/clicks required by the users before use and settings should be locked.
- 5.1.14 For key processes involving doctor and nursing users, the new system must have streamline and optimized process (eg. should have same or lesser clicks to operate).
- 5.1.15 Contractor to include as mandatory load testing for 100 concurrent users as part of implementation cost. This is to simulate the operation of 42 (and increasing) dialysis centres island wide, performing daily functions like Medication and

Doctor Rounding around the same time (ie. peak hour). The system is expected to start with 1200 users (and increasing).

6 SECURITY REQUIREMENTS

6.1 GENERAL

- 6.1.1 For account not using Non OAuth 2.0 / OpenID Connect authentication (Azure AD or Microsoft Entra), the user account or the administrator credentials must remain confidential and should be secured with a strong passphrase, along with two-factor authentication (2FA) enabled. Passwords must be changed every 365 days. Additionally, a password management policy that includes password retention history should be established to ensure the proper protection of Corporate Applications.
- 6.1.2 Contractor to implement strong authentication methods, including multi-factor authentication (MFA), confirms the use of role-based access control (RBAC) to limit access to sensitive information based on user roles, and maintains proper identity management practices, including regular access reviews.
- 6.1.3 Contractor shall provide detailed description of the security measures and procedures to prevent the introduction of malicious codes.
- 6.1.4 Contractor must seek prior written approval from NKF before opening any network ports for the application. This includes, but is not limited to, ports necessary for communication, data transfer, or integration with other systems. Contractor shall provide a detailed justification for the request, including security considerations and potential impacts on the overall system architecture.
- 6.1.5 Contractor shall monitor the application to ensure efficient performance and data integrity by (but not limited to):
 - Fixing all vulnerabilities found during security scans/penetration tests conducted by the Contractor itself and NKF.
 - Investigating and correcting of defects on the website as reported by NKF. This includes temporary corrections and bypass of the defects.
 - Recovering lost data, restoration, repair damaged data and the correction of erroneous data to the extent possible.
 - Proactively monitor the system and all related software used to ensure it is always up to date, address all security vulnerabilities promptly, and provide a monthly update report to NKF detailing the status and action taken.
- 6.1.6 NKF will perform initial and annual penetration test where applicable, contractor to remediate on any findings before go-live and on yearly basis under maintenance at no extra cost to NKF, and in accordance with their severity.
- 6.1.7 Contractor providing support for the application as a Software as a Service (SaaS) solution shall supply NKF with a current SOC 2 Type II report. This report must demonstrate the Contractor's adherence to security and operational controls over the relevant reporting period. Contractor shall provide the report upon request and ensure that any necessary updates are communicated in a timely manner.
- 6.1.8 Audit logs must be maintained and made available for review. Contractor agrees to provide these logs to NKF upon request for investigative purposes if needed.

- 6.1.9 In case of the system (including SAAS setting) being compromised (eg. ransom, lost of data), Contractor shall propose and implement a robust backup/restore strategy for the application, ensuring that backups are performed regularly based on the nature of the data. Backups must be stored securely and retained according to data retention policies, with a minimum retention period of 30 days. Additionally, backups should be readily accessible for restoration in the event of data loss or system failure (including SAAS setting). The cost of such backup solution to be indicate in price schedule as option.
- 6.1.10 Contractor with sub-contractor(s) to ensure due diligence on assessing their security practices and conducting risk assessments and ensure compliance with applicable security standards. Additionally, the contractor must ensure all sub-contractor(s) sign back-to-back non-disclosure agreement (NDA) to protect sensitive data and prevent data leaks on behalf of NKF.
- 6.1.11 Contractor to ensure that all employees receive regular training on security best practices and data protection.
- 6.1.12 Contractor to (or work with NKF security team to) document and test incident response plan involving continuous monitoring and logging of access and activities, with the capability to alert on suspicious behaviour. To conduct review of the associated logs regularly to ensure compliance and security.
- 6.1.13 Contractor shall promptly inform NKF of any security incidents or attacks affecting the Contractor's company within a reasonable timeframe. However, notification regarding any attacks on systems that support NKF's web application must occur within 2 hours of the Contractor becoming aware of the incident. The Contractor must provide detailed information about the incident, the nature of the threat, and the steps taken to mitigate the impact.

6.2 WEB HOSTING SECURITY

- 6.2.1 The administrator credential must not be shared and should be secured with strong password with prompt for change every minimum of 90 days. A password management policy, which include password retention history, should be in place to ensure the appropriate protection of NKF website.
- 6.2.2 Contractor shall ensure that the data flow on NKF website is kept secure and adhere to industry best practices. The Web Application Firewall (WAF) and Anti-virus software should be in place and patched regularly to ensure that site is protected from any cyber-attack. NKF's current requirement is OWASP top ten for WAF setup.
- 6.2.3 Secured HTTP (HTTPS) shall be used at all times. NKF will be providing the digital certificate.
- 6.2.4 Distributed Denial of Service (DDOS) protection should be provided by the hosting company and there should also be a process in place to inform us of any DDOS attack activities.
- 6.2.5 For any public facing component, contractor shall ensure that the anti-defacement protection to be in force at all time - with automatic detection and

prevention of unauthorised changes to our website. Unauthorized changes should revert to original automatically. There should also be a process in place to inform us of any such activities

6.3 APPLICATIONS SECURITY

- 6.3.1 The applications shall be resilient from the following area of vulnerabilities (but not limited to):
- Malicious code injection (e.g. SQL injection, Cross-site Scripting (XSS) and etc.)
 - Remote file inclusion
 - Cross-site request forgery (CSRF)
 - Insecure cryptographic storage
 - Insecure access control mechanism (e.g. account privilege escalation, failure to restrict URL access and etc.)
 - Insecure authentication management
 - Invalidated redirects
 - Improper error and exception handling
 - Security misconfiguration and application logic flaws.
- 6.3.2 Web site that requires login to have multi-factor authentication. In the case of single-sign-on setup with NKF AD, the MFA will leverage on NKF's existing setup. The Contractor shall implement secure authentication and authorization for APIs using standards such as OAuth 2.0 and establish measures like rate limiting and throttling to prevent abuse.
- 6.3.3 Use of PowerShell for process automation is not allowed. Contractor to inform NKF early on such or similar approach to seek agreement early to avoid dispute at latter stage. Contractor must perform change at no cost to NKF if such dispute occurs in the absence of mutual agreement.
- 6.3.4 Contractor shall implement data masking techniques for any sensitive information utilized in non-production environments, including development and testing. This masking shall ensure that personally identifiable information (PII) and other sensitive data are adequately obscured to prevent unauthorized access or disclosure. The Contractor shall document the data masking procedures and ensure that all personnel involved in non-production environments are trained on data security best practices.
- 6.3.5 Contractor to implement similar data masking onto production data wherever possible without impacting operation. Eg. partial NRIC in all reports unless required full NRIC for operation purpose.
- 6.3.6 Contractor shall ensure that database(s) are secured and encrypted in accordance with industry best practices. Contractor must implement appropriate measures to protect sensitive data from unauthorized access, including but not limited to encryption at rest and in transit. Compliance with applicable data protection regulations is mandatory, and the contractor shall provide documentation evidencing the security measures implemented.



- 6.3.7 Contractor to implement a logout session feature in the application, ensuring that users can securely terminate their session at any time. The logout functionality shall include the following requirements:
- Users must have the ability to log out from any page within the application.
 - Upon logging out, all user session data shall be cleared, and the user shall be redirected to the login page
 - The application shall automatically log out users after a specified period of inactivity, as determined in consultation with the Client, to enhance security.
 - The Contractor shall provide documentation detailing the logout process and any relevant configurations for the Client.
- 6.3.8 Contractor to ensure the availability of the following reports to support NKF in annual audits:
- User Access Report (In CRM this is the User Summary Report) – detailing which user has which access from which period.
 - Access Matrix Report – detailing the access of each security role designed/implemented.
 - User Activity Report – detailing user last login activity (including privileged user)
 - Data Audit Report or Function – to facilitate investigation of data error

Accepted By:

Authorized Signature:	_____	Date:	_____
Signatory's Name:	_____	Signatory's Title:	_____
Telephone Number:	_____	Contractor's Name:	_____
Email Address:	_____	Contractor's Stamp:	_____

ANNEX C

FUNCTIONAL REQUIREMENTS

1. OBJECTIVES

- 1.1 The objective of System is to provide the functions and tools to fully manage the Clinical, Administration and Patient Accounting requirements of NKF.
- 1.2 Contractor will prepare and document the business process shared and agreed upon in the requirements gathering sessions for sign off.
- 1.3 Contractor will document the design and walkthrough design with NKF IT for sign off.
- 1.4 Contractor will document the Data Migration Plan and subsequently the Data Migration Report for sign off.
- 1.5 Contractor to include NKF CRM reps during design phase to leverage on the teams' domain/operational experience.
- 1.6 Contractor to ensure the design factor in for smooth operation and support (DEVOPS mindset). This includes to foresee potential data corrections scenario when we implement strict validation to block user from making changes themselves. Where applicable, to incorporate self-help function for users or IT to implement data corrections.
- 1.7 Any system errors should have a closed loop whereby either to allow user self-help or direct them to IT; for background services to alert IT support for follow up actions.
- 1.8 NKF has full source code of current 2015 version. While we gather requirement from users, vendor is expected to jointly review vital logics from existing coding, to surface them for users to reconfirm if the logic is still good or outdated.
- 1.9 All source codes belong to NKF. As this system supports our core operations, we need our own NKF team to have some level of competency for contingency purpose. This includes regular check-in of source codes to our TFS.
- 1.10 All the IP rights of items created for this project belongs to NKF. NKF process is unique and sensitive, we need vendor to ensure non-disclosure of such information in any means.
- 1.11 Billing Support – the Contractor is required to provide support for month end closing for the first 3 months after the system goes live, and ILTC submission on the 4th month. This is during the 4 months warranty period requested.
- 1.12 Refer to Annex C1 attachments for detailed requirement and complete the assessment therein truthfully.

ANNEX D**SUPPORT REQUIREMENTS****1. GENERAL REQUIREMENTS**

- 1.1. Contractor should appoint a single point of contact for the support of the system. We will refer to this person as the Support Manager (SM).
- 1.2. Contractor shall provide support (including the management of upgrades, issues and resolutions) for as long as the term of the contract. Bug fix and data corrections to be included at no extra charge.
- 1.3. Contractor shall carry out upgrade for the system when new versions are available at no cost to NKF, after informing NKF on the deployment timeline of the new version including any new or updated features. If training is required, Contractor will provide to all users appointed by NKF and the cost is included.
- 1.4. Contractor shall provide a support contact number and email for NKF to report issues.
- 1.5. For Change Requests, NKF shall submit the request to the SM and the service provider shall provide an assessment of the cost/effort at no charge, within one week of the request. While NKF may have inhouse IT staffs trained in the product, the expectation is still vendor-managed mode of engagement.
- 1.6. Contractor to practice industrial standard for change management including bug fixing and source control.
- 1.7. Contractor shall support audit where required by NKF and carry out fixes to address any security issue.
- 1.8. Contractor shall indemnify NKF from any and all losses and damages incurred due to any malfunction or breaches of System. Any costs and effort incurred to rectify and recover from any such incidences shall be borne fully by the Contractor.
- 1.9. Contractor must track all incidents reported and update NKF the status and progress of every incident monthly or when requested for.
- 1.10. NKF operating hours:
 HQ: Monday to Friday, 8.30am to 6pm
 DC: Monday to Saturday, 7am to 11pm (some DCs operates throughout the night)
 Contractor can propose own support hours but emergency support must be available during DC operating hours for issues resulting in impact to patient care.
- 1.11. Contractor must commit to the following Key Performance Indicators (KPI):

Category	Description	Commit (Yes/No)
Availability	System must be available 24/7 and 99.5% of the time from any device.	
Performance	System must be able to complete tasks within a single or two screens at most.	
	Batch jobs must be completed within 30 minutes from inception.	

Resolution	Severity 1 – System is inoperable; must be rectified within 8 hours from the time reported.	
	Severity 2 – A module is inoperable, or a task cannot be completed; must be rectified within 24 hours from the time reported.	
	Severity 3 – For all other incidents; at least 80% must be rectified within 72 hours from the time reported.	

ANNEX E**HIGH LEVEL PROJECT PLAN**

Contractor shall provide a project plan, showing the high-level activities, key deliverable dates, time frames, resources and dependencies for procuring and implementing. The plan should have defined steps with specific milestones covering all critical elements of the commissioning process. Included in the commissioning plan should be the expected outcome of the activities to be performed. Key deliverables should be highlighted for schedule compliance. **The main functions must be delivered by end December 2025 while the optional functions can be delivered by end June 2026.**

The system is used by 5 main departments, contractor can consider running 2 tracks, where each track can handle 2-3 departments in order to optimize the turnaround time from each department.

The system has interface with multiple vendors including government agencies. Please refer to Annex C1 attachment for details and include engagement strategies in the project plan.

Main Departments
1. Medical Services
2. Nursing Services
3. Allied Health Services
4. Community Care
5. Finance & Risk Management

ANNEX F**CONTRACTOR'S EXPERIENCE IN SIMILAR PROJECTS**

All requirement mentioned herewith are mandatory, sufficient details must be provided to demonstrate experience and relevance to this project.

S/N	Enquiry	Response
1	Total number of successful projects valued at more than SGD 500,000 in last 2 years including details.	
2	<p>Provide at least 3 local client and project information of successful implementations of similar projects (Healthcare industry preferred).</p> <p><u>Project 1 Information</u></p> <p>1.1 Customer Name</p> <p>1.2 Company Address</p> <p>1.3 Company Description</p> <p>1.4 Contact Person</p> <p>1.5 Contact Person Telephone Number</p> <p>1.6 Contact Person Email Address</p> <p>1.7 Estimated Project Value (SGD)</p> <p>1.8 Project / Scope Description</p> <p>1.9 Duration of Project</p> <p>1.10 Resource strategy (implementation / support, onsite / offshore)</p> <p><u>Project 2 Information</u></p> <p>2.1 Customer Name</p> <p>2.2 Company Address</p> <p>2.3 Company Description</p> <p>2.4 Contact Person</p> <p>2.5 Contact Person Telephone Number</p> <p>2.6 Contact Person Email Address</p> <p>2.7 Estimated Project Value (SGD)</p> <p>2.8 Project / Scope Description</p> <p>2.9 Duration of Project</p> <p>2.10 Resource strategy (implementation / support, onsite / offshore)</p> <p><u>Project 3 Information</u></p> <p>3.1 Customer Name</p> <p>3.2 Company Address</p> <p>3.3 Company Description</p> <p>3.4 Contact Person</p> <p>3.5 Contact Person Telephone Number</p> <p>3.6 Contact Person Email Address</p> <p>3.7 Estimated Project Value (SGD)</p> <p>3.8 Project / Scope Description</p> <p>3.9 Duration of Project</p> <p>3.10 Resource strategy (implementation / support, onsite / offshore)</p>	

ANNEX G**TEAM COMPOSITION****Minimum team setup:**

Please indicate the proposed team structure for **implementation phase**:

Role	No. of staff(s)	Based in (state country)	Remarks (% commitment, % onsite, duration)
Project Director			
Project Manager			
Solution Architect			
Function Lead			
Functional			
Technical Lead			
Technical			
QA			
Infrastructure			

Please indicate the proposed team structure for **4 months warranty phase**:

Role	No. of staff(s)	Based in (state country)	Remarks (% commitment, % onsite, duration)
Project Director			
Project Manager			
Solution Architect			
Function Lead			
Functional			
Technical Lead			
Technical			
QA			
Infrastructure			

Please indicate the proposed team structure for **maintenance phase**:

Role	No. of staff(s)	Based in (state country)	Remarks (% commitment, % onsite, duration)
Project Director			
Project Manager			
Solution Architect			
Function Lead			
Functional			
Technical Lead			
Technical			
QA			
Infrastructure			


Individual details (complete this section for each proposed personnel):
Overview:

Name of person:	
Staff position for this project:	
Total years of experience:	
Years with current firm:	
Education (Degree and Specialization):	
Other Professional Qualifications:	
Based in (state country):	

Relevant Projects:

1	Project Name: Location: Project Owner: Notice to Proceed Start Date: Substantial Completion Date: Brief Description (scope, size, cost, etc) and specific role (title, full SDLC or support):
2	Project Name: Location: Project Owner: Notice to Proceed Start Date: Substantial Completion Date: Brief Description (scope, size, cost, etc) and specific role (title, full SDLC or support):

Accepted By:

Authorized Signature: _____

Date: _____

Signatory's Name: _____

Signatory's Title: _____

Vendor's Name: _____

Vendor's Stamp: _____

Email Address: _____

Telephone Number: _____

ANNEX H**PROJECT REQUIREMENT COMPLIANCES**

S/N	Requirement	Comply (Yes / No)	Remarks
1	<u>Scope of Work</u> As specified in Annex A.		
2	<u>Technical Requirements</u> As specified in Annex B.		
3	<u>Functional Requirements</u> Please provide details in Annex C attachment(s).		
4	<u>Support Requirements</u> As specified in Annex D.		
5	<u>High Level Project Plan</u> Please provide details in Annex E.		
6	<u>Track Records</u> Please provide details in Annex F.		
7	<u>Team Composition</u> Please provide details in Annex G.		
8	<u>Other attachments</u> Please provide details in Annex I, J, K and L.		

Accepted By:

Authorized Signature: _____

Date: _____

Signatory's Name: _____

Signatory's Title: _____

Vendor's Name: _____

Vendor's Stamp: _____

Email Address: _____

Telephone Number: _____

ANNEX I

APPLICATION SYSTEM ARCHITECTURE DIAGRAM

To provide the proposed architecture diagram, including the interface components between new platform with other internal systems (on-premise at NKF and/or external agencies), and how batch jobs will be run.

ANNEX J

LISTING OF LICENCE AGREEMENTS

To provide the list of licence agreements on Annex J. Vendor may be requested to provide the actual agreements, if needed.

ANNEX K

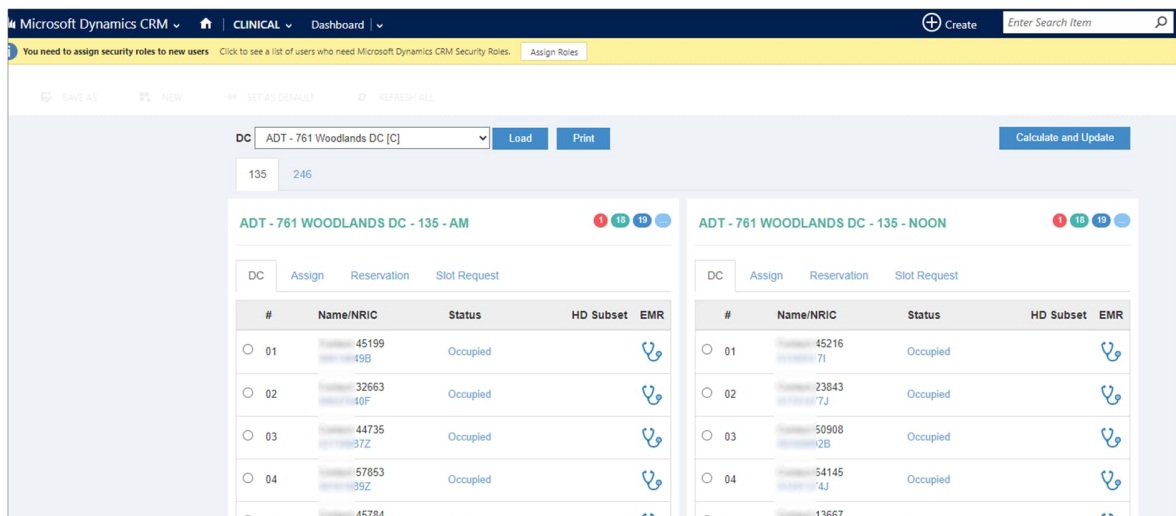
MOCK UP SCREENS

Listed below are shortlisted existing functions that are critical to nursing operation. These are HTML web resource that workaround the limitation of CRM2015 default UI. Contractor to include mock up screens to showcase your experience in building similar screens in the proposed system. Contractor may attach screens from your existing or past projects that had similar features to showcase your experience.

While NKF encourages out-of-the-box UI design to keep the system simple and easy to maintain, but contractor must be able to custom build similar UI where the need arises. Top priority will be ease of use and streamline of work process.

DC Census screen

This is the UI for DCs to allocate patients. It is like a sitting plan in a school. It contains important information like Chair type vs Patient condition (eg. Hep B?). It has shortcut to open EMR of patient.



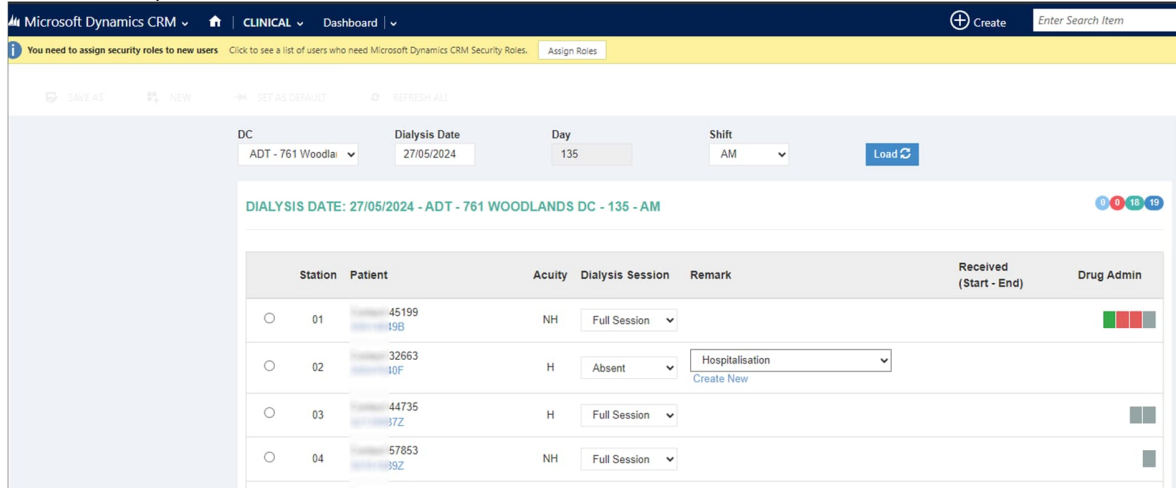
#	Name/NRIC	Status	HD Subset	EMR
01	45199 49B	Occupied		EMR
02	32663 40F	Occupied		EMR
03	44735 37Z	Occupied		EMR
04	57853 39Z	Occupied		EMR
05	45784	Occupied		EMR







#	Name/NRIC	Status	HD Subset	EMR
01	45216 71	Occupied		EMR
02	23843 7J	Occupied		EMR
03	50908 2B	Occupied		EMR
04	34145 4J	Occupied		EMR
05	13667	Occupied		EMR

Dialysis Attendance screen

This is the UI for taking daily attendance. The data are generated every morning 4am to reduce loading time during operation.

The coloured icons on the right are patients' active prescriptions. The different colour codes helps nursing to track the medication status (grey is pending action, green is administered, red is not administered).

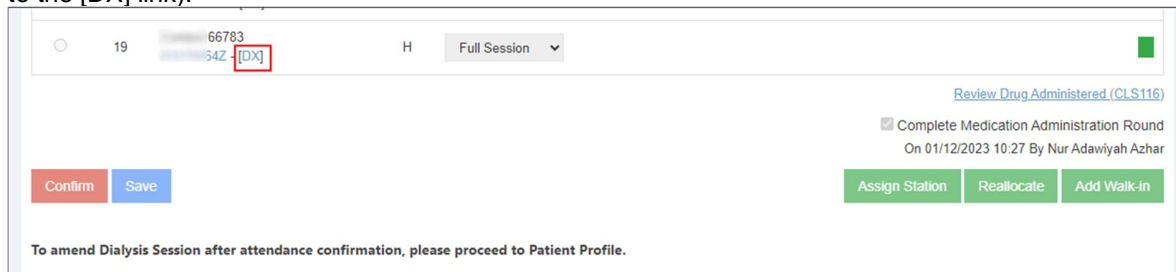



Station	Patient	Acuity	Dialysis Session	Remark	Received (Start - End)	Drug Admin
01	45199 19B	NH	Full Session			  
02	32663 10F	H	Absent	Hospitalisation Create New		
03	44735 17Z	H	Full Session			 
04	57853 19Z	NH	Full Session			

The bottom of the Attendance screen also has function to,

- allow nursing to print Medication report for reconciliation
- reallocate patient to different chair
- add walk-in for adhoc treatment for patient from a different shift.

After the attendance is confirmed, the screen also allow nursing to make amendments (referring to the [DX] link).



☐ 19 66783
 54Z [DX] H Full Session 

[Review Drug Administered \(CL S116\)](#)
☒ Complete Medication Administration Round
 On 01/12/2023 10:27 By Nur Adawiyah Azhar

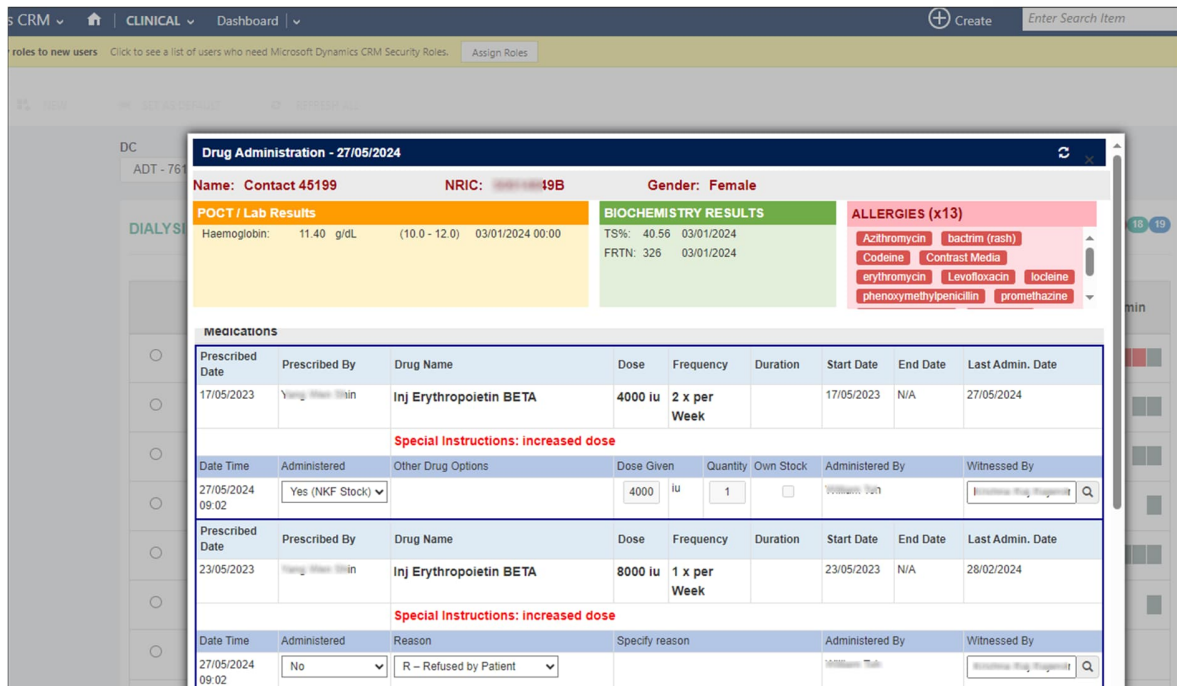
To amend Dialysis Session after attendance confirmation, please proceed to Patient Profile.

Drug Administration screen

Continuing from the Attendance screen, on the active prescription icons, clicking it will open the UI for nursing to record the medication performed.

This UI shows vital information that has impact to patient medication (eg. Allergies and lab result). It allows for nursing to record if the medication was given or not given due to specific reasons. It has to capture both the nursing users name where one performs the drug administration while the other performs the witnessing.

As all our 43+ dialysis centres perform the medication round at around the same time (ie. peak hours), this screen is required to be load tested simulating at least 100 concurrent users. Detailed load test parameters can be discussed at later stage.



Drug Administration - 27/05/2024

Name: Contact 45199 NRIC: 99B-99B-99B-99B Gender: Female

POCT / Lab Results

Haemoglobin:	11.40 g/dL	(10.0 - 12.0)	03/01/2024 00:00
--------------	------------	---------------	------------------

BIOCHEMISTRY RESULTS

TS%:	40.56	03/01/2024
FRTN:	326	03/01/2024

ALLERGIES (x13)

- Azithromycin
- bacrim (rash)
- Codeine
- Contrast Media
- erythromycin
- Levofloxacin
- Iodine
- phenoxymethylpenicillin
- promethazine

Medications

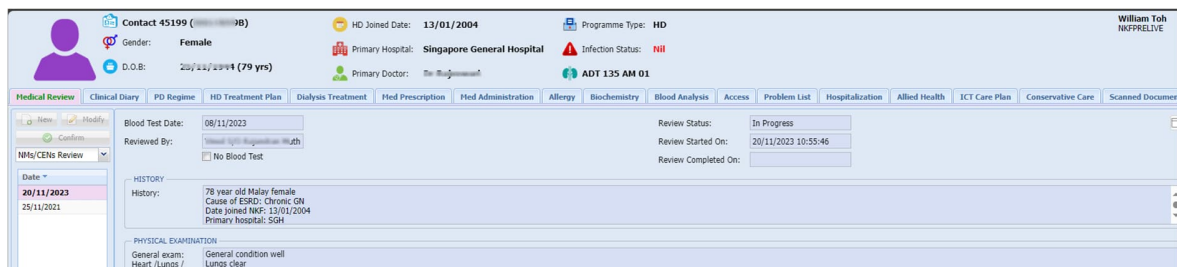
Prescribed Date	Prescribed By	Drug Name	Dose	Frequency	Duration	Start Date	End Date	Last Admin. Date
17/05/2023	Yang Wen Bin	Inj Erythropoietin BETA	4000 iu	2 x per Week		17/05/2023	N/A	27/05/2024
Special Instructions: increased dose								
Date Time	Administered	Other Drug Options	Dose Given	Quantity	Own Stock	Administered By	Witnessed By	
27/05/2024 09:02	Yes (NKF Stock)		4000 iu	1		William Toh	William Toh	
Prescribed Date	Prescribed By	Drug Name	Dose	Frequency	Duration	Start Date	End Date	Last Admin. Date
23/05/2023	Yang Wen Bin	Inj Erythropoietin BETA	8000 iu	1 x per Week		23/05/2023	N/A	28/02/2024
Special Instructions: increased dose								
Date Time	Administered	Reason	Specify reason	Administered By	Witnessed By			
27/05/2024 09:02	No	R - Refused by Patient		William Toh	William Toh			

EMR screens

This screen in CRM2015 was built with Sencha, which is like a bootstrap library.

This customization was done due to CRM2015's default UI is not easy for cross-navigation. During a medical review, doctors will need to toggle many pages to look at patients' various information like treatment history, blood test history/trending, medication listing etc, before they can propose the next course of action.

It will be great if the new platform natively allows easy cross navigation and charts for trending, without the need for third party libraries.



Medical Review

Contact 45199 (79 yrs) HD Joined Date: 13/01/2004 Programme Type: HD William Toh NKFPRELIVE

Gender: Female Primary Hospital: Singapore General Hospital Infection Status: Nil

D.O.B: 20/11/1944 (79 yrs) Primary Doctor: Dr. [Name] ADT 135 AM 01

Medical Review Clinical Diary PD Regime HD Treatment Plan Dialysis Treatment Med Prescription Med Administration Allergy Biochemistry Blood Analysis Access Problem List Hospitalization Allied Health ICT Care Plan Conservative Care Scanned Documents

Blood Test Date: 08/11/2023 Review Status: In Progress

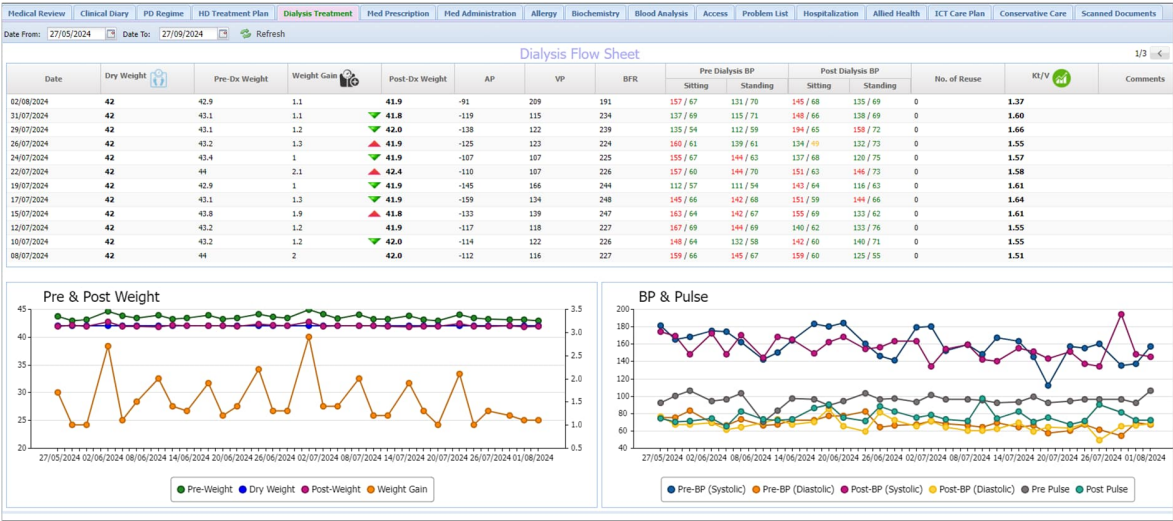
Reviewed By: [Name] Review Started On: 20/11/2023 10:55:46

History: 78 year old Malay female
Cause of ESRD: Chronic GN
Date joined NKF: 13/01/2004
Primary hospital: SGH

PHYSICAL EXAMINATION

General exam: General condition well

Heart / Lungs / Lungs clear



ANNEX L

THIRD PARTY EVALUATION FORM

To fill up the Third Party Evaluation Form. Please fill up to your best knowledge and with respect to the proposed solution/components. Shortlisted vendors will be contacted for clarification with NKF security team and risk management team.

Accepted By:

Authorized Signature: _____

Date: _____

Signatory Name: _____

Signatory Title: _____

Telephone Number: _____

Contractor's Name: _____

Email Address: _____

Contractor's Stamp: _____