Living-Donor Kidney Transplant App

health-procedure journey

1. Referral & Intake

A patient with end-stage kidney disease is referred by their nephrologist to a transplant center. Initial paperwork, eligibility review, and education sessions occur. Basic demographics and insurance are verified. If suitable, the patient is registered for evaluation.

2. Baseline Workup

Comprehensive labs, imaging (CT, echo), and infection screening are performed. Psychosocial and adherence assessments ensure long-term viability. Results identify comorbidities that need optimization. Any red flag may pause or delay progress.

3. Compatibility & Matching

HLA typing and crossmatching confirm immune compatibility. Panel reactive antibody (PRA) levels guide donor selection. If no living donor exists, the patient joins the national deceased donor list. Compatible donor match triggers further evaluation.

4. Donor Evaluation

Potential donor undergoes medical, surgical, and psychosocial testing. Focus is on ensuring donor safety and long-term health. If cleared, both donor and recipient move forward together. If not, the search restarts for another compatible donor.

5. Multidisciplinary Board Review

A team of surgeons, nephrologists, psychologists, and coordinators convene. They assess both donor and recipient readiness and risk. They may approve, deny, or request additional tests. A request for more data sends the case back to workup.

6. Pre-Op Optimization

All medical conditions are stabilized before surgery. Blood pressure, diabetes, and infections are carefully managed. Vaccines are updated and medications adjusted. Any new issue discovered can revert to further workup.

7. OR Scheduling & Consent

Operating rooms and surgical teams are booked for both parties. Final crossmatch ensures immunologic safety before incision. Legal and informed consent documents are signed. Unexpected findings can delay or return to optimization.

8. Transplant Surgery

The donor kidney is removed (often laparoscopically) and implanted into the recipient. Vascular and ureteric connections are made with precision. Warm ischemia time is minimized for graft survival. The procedure culminates with immediate graft reperfusion.

9. Immediate Post-Op (ICU/PACU)

Patient is monitored for hemodynamic stability and urine output. Pain, electrolytes, and early complications are managed. Rejection or thrombosis risks are highest in this phase. Stabilization leads to transfer to the ward.

10. Ward Rehab & Education

Focus shifts to recovery, ambulation, and wound care. Patients learn about immunosuppressant schedules and side effects. Nursing staff reinforce hydration, diet, and infection precautions. Discharge planning begins once milestones are met.

11. Home Monitoring

Outpatient labs and telehealth follow-ups ensure graft function. Immunosuppressant trough levels are closely tracked. Any deviation triggers alerts to the transplant coordinator. Stable trends lead to longer follow-up intervals.

12. Complication Management

Rejection, infection, or drug toxicity can threaten the graft. Hospital readmission may be required for biopsy and treatment. Successful management returns the patient home. Severe graft loss triggers re-listing back to "Compatibility & Matching".

Extra necessary files

You are given two files represent two complementary layers of the logical model:

1. `transplant_journey_routes_only.csv`
2. `transplant_journey_questions_only.json`

Requirements

Backend

Scope: Exactly 6 routes in FastAPI.

Goal: A user can signup/login/logout, see current stage, answer questions, and continue later from where they left off. Each user's current stage/state must persist in Postgres.

Functional requirements

Route	Description
`POST /signup`	create user credentials (No need for google auth, keep it as simple as you can)
`POST /login`	authenticate user and establish a session (token or cookie, your choice).
`POST /logout`	invalidate the session.
`GET /journey/current`	return the user's current stage name and its questions from the JSON.
`POST /journey/answer`	submit answers for the current stage and advance to the next appropriate stage.
`DELETE /user`	which anonymizes user data (replace PII with UUID hash, keep audit trail).

Evaluation: Candidate should describe irreversible anonymization and what stays for analytics.

- The journey is not strictly linear; the JSON implies forward progress with possible returns (e.g., more workup before proceeding).
- Persist which stage the user is at so returning users resume correctly.

Important:

- Please propose the data model yourself (tables, entities, relationships, indices, constraints).
- In your README, list the benefits and drawbacks of your chosen design approach and alternatives you considered.**

Frontend

Frontend (minimal) React single page: Shows: "Hello, ", current stage name, and the list of questions for that stage (plain text). with textbox/select component. Buttons: Login, Signup, Logout, Submit answers / Next.

No styling required. Focus is on correctness and clarity.

Deliverables

- Repo with /backend, /frontend, /data, /migrations.

README that includes:

- API docs (FastAPI /docs or an OpenAPI file).
- Design explanations, how come you took those approaches
- Your proposed data model (ERD or text) + benefits & drawbacks of this design and alternatives.

- How to run locally with docker compose up.
- A simple script to populate table's DB with patients data
- Please share with me your githup repo for this home assignment

Best of luck!

Fill free to contact me for questions.

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