Protocol: CKD Prevention in Hypertensive Patients (Steps 1–6)

| **High-Risk Groups fo CKD Screening** | **Why?** |
| --- | --- |
| People with hypertension | High BP damages kidney blood vessels |
| People with diabetes | Sugar damages kidney filters |
| Aged >60 years | Kidney function declines with age |
| Family history of kidney disease | Higher genetic risk |
| Smokers, obese individuals | Independent CKD risk factors |
| Those on NSAIDs or nephrotoxic drugs | Can cause silent kidney injury |
| Step 1: Confirm Hypertension & Assess Lifestyle Risks |  |

| **Item** | **If YES…** | **GP Action** | **Permission to AI** |
| --- | --- | --- | --- |
| Hypertension (≥140/90) | Confirmed | Start risk workup and ***CKD screening*** ***(in the next table)*** | * If hypertension (+) 2x test in different place and times 🡪 Refer to check Consult GP * If it is the first time they checked 🡪 come again next week or the best suggestion is to use ambulatory test (in their own house, when they are comfortable) |
| Diabetes / Obesity / CVD | Present | CKD screen + BP goal <130/80 |  |
|  | Calculate BMI calculator : <https://www.calculator.net/bmi-calculator.html> Abnormal 🡪 refer to GP)  Calculate CVD Risk **:** <https://tools.acc.org/ASCVD-Risk-Estimator-Plus> Abnormal 🡪 refer to GP)  Diabetes :Order Fasting Blooad Glucose and HbA1C (Abnormal 🡪 refer to GP) | | |
| Family history of CKD | Present | Order early eGFR + ACR tests |  |
| Uses NSAIDs or herbals | Yes | Educate; recommend discontinuation (ONLY IF THEY START BY THEIR OWN) 🡪 IF PRESCRIBBED (CONSULT WITH THEIR DOCTORS) | | **Situation** | **AI-Safe Action** | | --- | --- | | Patient uses NSAIDs occasionally for short-term pain | Recommend limiting use, ensure hydration, and suggest discussing with GP | | Patient has no CKD, no diabetes, no hypertension | Safe to advise standard OTC NSAID use guidance with warning signs | | Herbal supplement use | Safe to flag and recommend discontinuation unless prescribed | | Generic symptoms (nocturia, frothy urine) | AI can flag these as CKD warning signs and recommend lab testing | | Healthy patient asks about salt, diet, hydration | AI can give evidence-based lifestyle advice (e.g., DASH diet, <2g sodium/day) | |
| Nocturia/frothy urine/fatigue | Yes | Suspect early CKD → test ACR/eGFR |  |
| High salt, sedentary, smoker | Yes | Lifestyle counseling + diet/exercise plan | DASH diet, <2g sodium/day |
|  | **AI Response**  Here are a few suggestions you can consider:   * 🍽️ Limit processed and packaged foods—aim for <2 grams of sodium per day. * 🥗 Try a DASH-style diet: rich in fruits, vegetables, whole grains, and low-fat dairy. * 🚶‍♀️ Start with 10–15 minutes of walking per day, then increase gradually to 30 minutes on most days. * 🚭 If you smoke, it’s never too late to quit. Consider reaching out to a quitline or your doctor for support.   For personalized support or if you have other conditions, it's best to speak with your GP or a dietitian." | | |
| Poor sleep/stress | Yes | Sleep hygiene + screen for mental health issues |  |
|  | "Stress and poor sleep can raise blood pressure and affect your overall well-being. Here are some techniques that may help:   * 🛌 Aim for 7–9 hours of sleep per night. Try a regular bedtime and limit screens before bed. * ☕ Avoid caffeine late in the day, and reduce heavy meals or alcohol before sleep. * 🧘 Try stress-reduction techniques like breathing exercises, journaling, or mindfulness apps. * 📅 If stress or sleep problems are ongoing or affecting your mood or energy, it’s a good idea to speak to your GP, psychologist, or counselor." | | |

# Step 2: Measure Baseline Kidney & Cardiovascular Health

| **Test** | **Why** | **Next Step Based on Result** |
| --- | --- | --- |
| Serum creatinine & eGFR | Kidney filtration | eGFR <60 → repeat in 3 months to confirm CKD |
| Urine ACR | Detect proteinuria | ACR ≥30 → **Start ACEi/ARB unless contraindicated 🡪 (Consult GP)** |
| HbA1c | Diabetes control | Target ~7%; **individualize if older/frail** |
| Fasting lipids | CVD risk | If eGFR <60 or age >50 → **Start statin (Consult GP)** |
| **Electrolytes (Not Covered by BPJS)** | Potassium, acidosis | Adjust meds if K+ >5.5 or bicarbonate <22 |
| ECG (if age >60 or symptoms) | **Cardiac risk**  <https://tools.acc.org/ASCVD-Risk-Estimator-Plus> | **Refer to cardiology if abnormal** |

# Step 3: Stratify Individual Risk & Personalize Targets

Kidney Risk Tier (Based on eGFR + ACR):

| eGFR & ACR | Risk | Monitoring | Action |
| --- | --- | --- | --- |
| eGFR ≥60 & ACR <30 | Low | Yearly | Lifestyle advice, maintain BP <140/90 |
| eGFR 45–59 or ACR 30–300 | Moderate | Every 6 months | **Start ACEi/ARB, aim BP <130/80 (Refer = Consult to GP)** |
| eGFR <45 or ACR >300 | High | Every 3 months | Refer to nephrologist, intensive BP/CVD care |

CVD Risk (Use ASCVD Calculator): <https://tools.acc.org/ASCVD-Risk-Estimator-Plus>

HbA1c Targets (for Diabetic Patients):

| Profile | HbA1c Goal |
| --- | --- |
| Healthy | ~7% |
| Frail/elderly | **7.5–8.5% (Refer : Consult GP)** |
| CKD + albuminuria | **Add SGLT2i or GLP-1a if eGFR permits (Refer : Consult GP)** |

Lifestyle Advice

| Lifestyle Area | Suggestion (AI-Safe) | Why It’s Safe |
| --- | --- | --- |
| Sodium Reduction | Limit sodium to <2g/day. Choose fresh foods, read labels, avoid processed items. | Evidence-based, aligns with WHO & national guidelines. Safe across populations.  **Guideline :** |
| DASH Diet | Eat fruits, vegetables, whole grains, low-fat dairy, lean protein. Limit sweets and red meat. | Broadly recommended; flexible and adaptable to different cultures. |
| Physical Activity | Aim for 30 minutes of moderate activity (e.g., brisk walking) on most days. | Based on WHO guidelines; fitapp can encourage activity without prescribing. |
| Weight Management | Encourage gradual weight loss if overweight. A 5–10% reduction can help. | Safe when framed as general advice; avoids specific calorie prescriptions. |
| Hydration | Drink water regularly unless advised otherwise by a doctor. | Promotes kidney health but warns users with fluid restrictions to consult a GP. |
| Smoking Cessation | Stop smoking to protect kidneys and heart. Suggest seeing a GP or using quitline. | General advice; avoids listing medications or interventions. |
| Sleep & Stress | Aim for 7–9 hrs sleep. Reduce screen time, try breathing exercises or light stretching. | Promotes healthy habits; no diagnosis or treatment implied. |

# Step 4: Initiate or Adjust Treatment Plan

| **Patient Profile** | **Action** | **Rationale / Notes** |
| --- | --- | --- |
| No proteinuria, low CVD risk | Lifestyle changes only; consider delaying pharmacologic treatment if BP <140/90 | Monitor closely; reinforce DASH diet, weight loss, sodium restriction |
| Albuminuria (ACR ≥30 mg/g) or moderate CVD risk | **Start ACE inhibitor or ARB; set BP goal <130/80 mmHg (Refer : Consult to GP )** | Protects kidney and cardiovascular function; monitor potassium and creatinine |
| Diabetic with albuminuria | Add SGLT2 inhibitor if eGFR ≥30; optimize HbA1c (~7%) **(Refer : Consult to GP )** | Renal-protective, reduces progression risk |
| High ASCVD risk or age >50 | Initiate statin therapy regardless of LDL level**(Refer : Consult to GP )** | Reduces cardiovascular events in CKD patients |
| Uncontrolled BP despite lifestyle + 2 meds | Evaluate for secondary hypertension; consider referral **(Refer : Consult to GP )** | Could indicate renovascular disease or endocrine causes |

# Step 5: Educate the Patient

| **Patient Type** | **Education Focus** | **AI-Safe Messaging** |
| --- | --- | --- |
| Young adult | CKD prevention, fertility/family planning, medication risks | Explain that healthy kidneys support lifelong wellness; discuss NSAID risks |
| Older adult (≥65) | Avoid dehydration, polypharmacy, proper follow-up | Encourage regular GP visits; hydration guidance |
| Low health literacy | Visual, simple explanations; family involvement encouraged | Use “teach-back” method to confirm understanding |

# Step 6: Set Monitoring Plan

| **Parameter** | **Low Risk (G1/A1)** | **Moderate Risk (G2-G3a/A2)** | **High Risk (G3b-G5/A3)** |
| --- | --- | --- | --- |
| eGFR, ACR | Yearly | Every 6 months | Every 3 months |
| BP, weight | Every 3–6 months | Every 2–3 months | Monthly or more frequently |
| Medication review | Annually | Every 6 months | Every 3–6 months |
| Referral to nephrologist | Not needed | If ACR >300 or rapid decline | Always co-manage with specialist |