SUMMARY

GOALS

✓ Appropriately refer to Nephrologist and for Dialysis Access
✓ Recognize End Stage Renal Disease (ESRD) as a strong risk factor for Atherosclerotic Cardiovascular Disease (ASCVD)
✓ Preserve residual renal function as long as possible on hemodialysis (HD)
✓ Assess for transplant candidacy
✓ Recognize and promptly refer HD access complications
✓ Understand management of HD complications
✓ Coordinate Palliative and End of Life Care

ALERTS

• If signs/symptoms of uremia present, refer to higher level of care (HLOC) for HD start
• If hyperkalemia, decompensated or new onset congestive heart failure (CHF/dyspnea/fluid overload), refer to HLOC, HD start imminent
• Alert nephrologist for clinical or radiographic evidence for volume overload/depletion, inability to control hypertension (HTN) or metabolic issues
• Avoid Tunneled Dialysis Catheters—high mortality and morbidity
• ESRD with microhematuria needs cystoscopy and ultrasound (US) to rule out renal cell carcinoma (RCC) or other uroepithelial carcinomas
• Estimated glomerular filtration rate (GFR) < 20 ml/min can be considered for a referral for transplant evaluation

DIAGNOSTIC CRITERIA

• ESRD is a progressive disease defined as kidney failure and GFR < 15*. When uremia† presents, long-term dialysis or kidney transplant is ultimately necessary to sustain life. ESRD = stage 5 chronic kidney disease (CKD 5), which may be further classified as non-dialysis (5ND), dialysis (5D), and transplant (5T).
• Patients in earlier stages (CKD 3-4), if associated with albuminuria, are at very high risk of progression, and that risk is directly proportional to the degree of albuminuria.
• Obtain renal function labs and urine albumin to creatinine ratio (UACR) at presentation and quarterly. Frank proteinuria: Use the protein-creatinine (UPCR).
• GFR is measured in mL/min/1.73 m2.
• †Uremia: a clinical syndrome produced by the toxic effects of abnormally high concentrations of nitrogenuous substances in the blood as a result of the kidney's failure to expel waste products by way of the urine.

Classification of Kidney Disease by GFR
Stage 1: GFR value mL/min/1.73m2 > 90 – Normal or high function
Stage 2: GFR value mL/min/1.73m2 60-89 – Slightly decreased function
Stage 3a: GFR value mL/min/1.73m2 45-59 – Mild to moderately decreased function
Stage 3b: GFR value mL/min/1.73m2 30-44 – Moderately to severely decreased function
Stage 4: GFR value mL/min/1.73m2 15-29 – Severely decreased function
Stage 5: GFR value mL/min/1.73m2 < 15 – Kidney failure

EVALUATION

• History: Symptoms of uremia are non-specific and may include one or more of the following: weakness, anorexia, fatigue, nausea and vomiting (N/V), reversal of sleep patterns and fluid retention/dyspnea. Advanced disease may be associated with chest pain, mental status changes, paresthesias, and seizures. Urine volume.
• Physical: Assess volume status (jugular vein distension [JVD], pulmonary, cardiac, edema, skin turgor), evidence for serositis (rub) and evaluate vascular access (if present). See detailed vascular
access exam on page 3 and Attachment B.

- **Labs:** CBC and CMP are the most critical to obtain immediately. HIV, HBV (HBsAg), and Hepatitis C studies are needed for acceptance by the HD provider. Other studies (phosphate, iPTH) will not affect immediate management. See pages 5 and 12.
- **Diagnostics:** Electrocardiogram (EKG) for electrolyte abnormalities and chest X-ray (CXR) for shortness of breath/concern for effusions. See page 18.

### TREATMENT

- Identify and mitigate factors that may cause a more rapid decline in renal function. Delay HD start as long as possible as there is no benefit to “early start of dialysis.” See pages 7 and 8.
- Treatment is renal replacement therapy (RRT): HD and/or renal transplant (RT). Peritoneal dialysis is not an option in CDCR.
- Nephrologist generally manages anemia, hyperkalemia, hyperparathyroidism, metabolic bone disease (MBD), and metabolic acidosis. Primary Care Providers (PCPs) will manage underlying comorbidities such as HTN, lipids, diabetes, and ASCVD.
- When HD is recommended, the dialysis nephrologist and PCP manage graft complications. Keep communication lines open.
- Administer recommended immunizations, especially if under RT evaluation. See Attachment A.
- Central transplant team will automatically screen all ESRD patients for referral to transplant center. A Request for Service (RFS) is not required.
- End of life care (see page 22). Engage in a frank discussion regarding dialysis as a choice, especially for elderly patients with conditions that affect both quality as well as anticipated quantity of life.

### MONITORING

Monitor for:

- **Symptoms which may indicate need for HD. See page 7.**
  - Medications which should be avoided, used with caution, or require dose adjustments. See pages 27-29.
  - Acute and chronic complications of ESRD. See pages 16-20.
  - Factors which may affect residual renal function. See page 15.
  - Vascular access complications. See Attachment B.
  - Control of underlying conditions: HTN (goal BP < 130/80 if tolerated, otherwise < 140/90), DM (7-8% or set target, see precautions on over-aggressive DM control, page 18), autoimmune disorders, etc.
  - Contraindications/concerns or sentinel events that may impact a patient’s suitability for renal transplant. Please contact the RT team (CPHCSTransplantProgramCoordinator@cdcr.ca.gov).