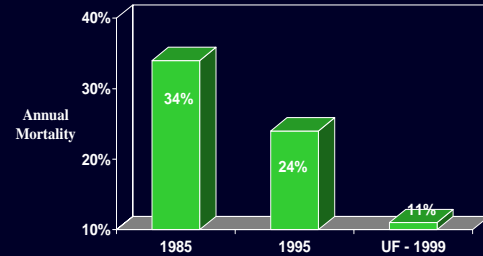


Management of ESRD

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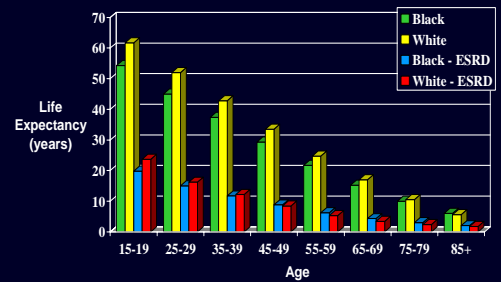
Hemodialysis mortality changes over the past decade



End-stage renal disease continues to be a public health problem

- ◆ Cost of providing renal replacement therapy
 - ◆ \$13.1 billion in 1995
 - ◆ \$67,500 per patient per year
 - ◆ 17% increase over 1994
 - 3% increase per patient
 - Adjusted for inflation, 0 to -2% decrease per patient

ESRD decreases survival



USRDS 1997 Annual Report

Issues in the management of the patient with ESRD

- ◆ Vascular access
- ◆ $\text{Ca}^{+2}/\text{PO}_4^-$ metabolism
- ◆ Anemia
- ◆ Blood pressure
- ◆ Health screening

Vascular access

- ◆ Arteriovenous fistula is preferred over graft
 - ◆ Less infection
 - ◆ Longer life-span
 - ◆ Clots less

Management of AVF in the HD unit

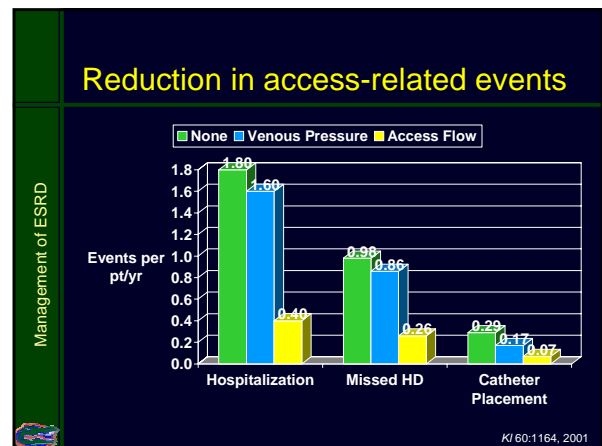
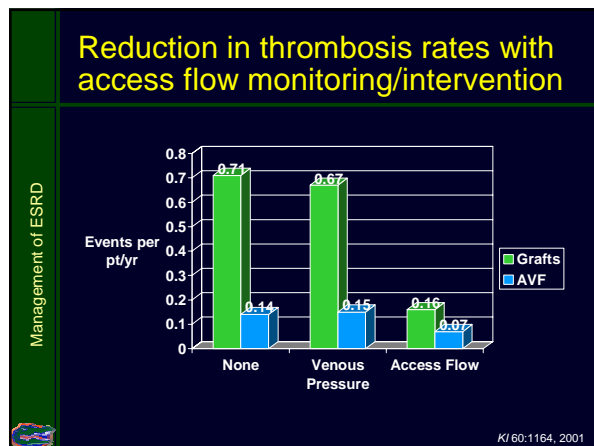
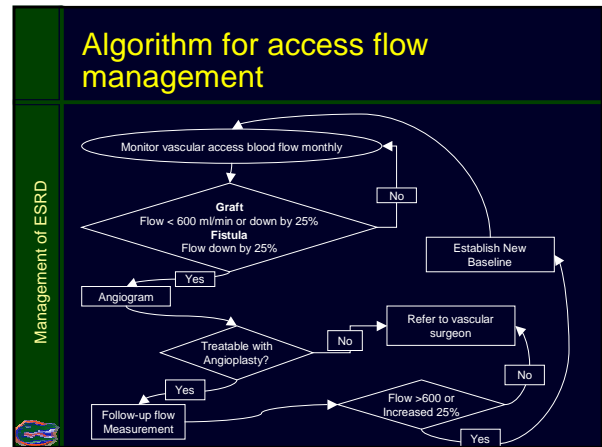
- Do not use until "cleared" by vascular surgery

Management of AVF in the HD unit

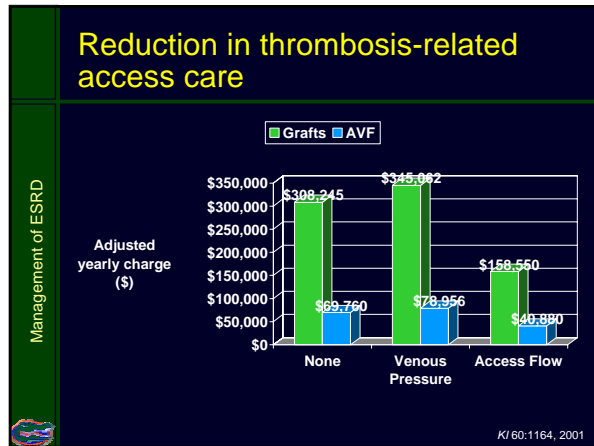
- Prevention of clotting is better than allowing to clot
 - Venous neointimal hyperplasia leads to progressive stenosis at the venous anastomosis site, particularly with grafts
 - Lots of ways designed to predict which patients are developing VNH
 - Venous pressure at specified blood flow
 - Recirculation
 - Changes in Kt/V

Prediction of patients with progressive VNH

- Access blood flow
 - Low blood flow or decreasing blood flow is predictive of increased risk of thrombosis in the next six months



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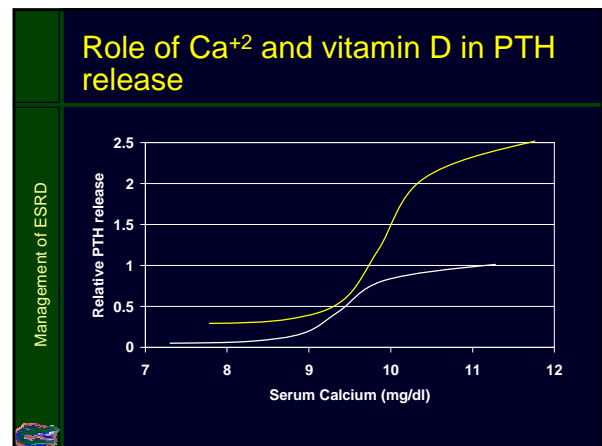


- ### Care of the tunneled catheter
- ◆ Tunneled Ash-Split catheter compared to non-tunneled catheter
 - ◆ Less infections
 - ◆ No access other than by hemodialysis nursing staff
 - ◆ Only exception - code situation
- Management of ESRD

- ### Issues in the management of the patient with ESRD
- ◆ Vascular access
 - ◆ $\text{Ca}^{+2}/\text{PO}_4^-$ metabolism
 - ◆ Anemia
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 - ◆ Health screening
- Management of ESRD

- ### $\text{Ca}^{+2}/\text{PO}_4^-$ management
- ◆ Subtle accumulation of PO_4^- leads to increased parathyroid gland PTH release
 - ◆ Hyperparathyroidism stimulates renal PO_4^- excretion
 - ◆ Hyperparathyroidism, along with Ca^{+2} and PO_4^- disturbances, leads to a variety of bone disease
- Management of ESRD


- ### Prevention of secondary hyperparathyroidism
- ◆ Prevention of hyperphosphatemia
 - ◆ Aluminum hydroxide
 - ◆ Calcium-based binders
 - Calcium carbonate
 - Calcium "elixir"
 - ◆ RenaGel
- Management of ESRD



Management of ESRD

Adynamic bone disease


- ◆ Loss of normal remodeling of bone in response to physiologic stresses
- ◆ Leads to increased risk of fractures
- ◆ PTH necessary for normal bone remodeling
 - ◆ Stimulant of both bone resorption and bone formation
- ◆ Suppressed PTH levels can lead to adynamic bone disease
- ◆ PTH goal 3-5x upper limit of normal for assay



Management of ESRD

Issues in the management of the patient with ESRD


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Management of ESRD

Erythropoietin


- ◆ The greatest success story in biotechnology to date?
- ◆ Hematocrit
 - ◆ Without epo - 20%
 - ◆ With epo - whatever you want
 - ◆ Goal - 33-36%



Management of ESRD

Causes of erythropoietin resistance


- ◆ Iron deficiency
 - ◆ Patients lose blood with every dialysis treatment
 - ◆ "Uremia" causes impaired iron utilization
- ◆ Criteria for iron deficiency
 - Iron saturation < 20%
 - Ferritin < 100



Management of ESRD

Treatment of iron deficiency


- ◆ Every dialysis patient should receive oral iron, 3x/d
- ◆ If iron deficient on oral iron,
 - ◆ Parenteral iron dextran, 1000 mg total dose
 - ◆ Rare allergy to iron dextran
 - Iron sucrose



Management of ESRD

Causes of epo resistance


- ◆ Ongoing inflammation or infection
- ◆ Aluminum overload
- ◆ Ongoing blood loss other than from HD



Management of ESRD

Issues in the management of the patient with ESRD


- ♦ Vascular access
- ♦ $\text{Ca}^{+2}/\text{PO}_4^-$ metabolism
- ♦ Anemia
- ♦ Blood pressure
- ♦ Health screening



Management of ESRD

Blood pressure management


- ♦ Most common cause of mortality in patients with ESRD is cardiovascular mortality
- ♦ Volume management
- ♦ ACE-I
- ♦ Beta blockers



Management of ESRD

Issues in the management of the patient with ESRD


- ♦ Vascular access
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- ♦ Anemia
- ♦ Blood pressure
- ♦ Health screening



Management of ESRD

Routine health screening

- ♦ Mammography
- ♦ Prostate Ca
- ♦ Colon Ca




Management of ESRD

Health maintenance in ESRD

A 61 y/o patient with end-stage renal disease is referred to you for evaluation of weight loss. Which of the following types of cancer are of particular concern because of a substantially increased incidence in dialysis patients?

- A. Parathyroid cancer
- B. Adrenal cancer
- C. Renal cell cancer
- D. Skin cancer
- E. Colon cancer



Management of ESRD

Issues in the management of the patient with ESRD

- ♦ Vascular access
- ♦ $\text{Ca}^{+2}/\text{PO}_4^-$ metabolism
- ♦ Anemia
- ♦ Blood pressure
- ♦ Health screening
- ♦ Psychiatric
 - ♦ Depression
 - ♦ Dementia

