

# Fluid Assessment & Management in Peritoneal Dialysis Patients



# Overview

- ◆ Why do fluids need to be balanced?
- ◆ How can fluid balance be achieved?
- ◆ What are the signs too much fluid?
- ◆ What are the signs of too little fluid?
- ◆ What are challenges of achieving balance?



# Need for Fluid Balance

- ◆ 40-50% of mortality in Peritoneal Dialysis (PD) patients is from cardiovascular (CV) disease
- ◆ Accelerated CV disease is found in patients after just 2 years on dialysis
- ◆ Risk for CV disease is further compounded by: diabetes, smoking hypercholesterolemia, uremia, and **FLUID VOLUME OVERLOAD**



# Importance of Achieving Balance

- ◆ Inadequate fluid removal (hypervolemia) is the second most frequent cited reason for PD failure, resulting in transfer to hemodialysis
- ◆ Fluid overload (hypervolemia) is prevalent in PD population, and becomes more pronounced after a long time on PD



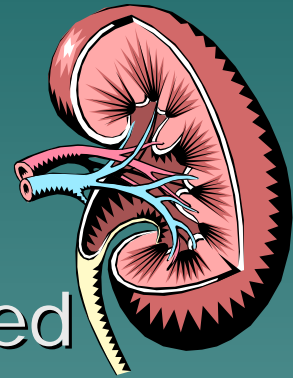
# Importance of Achieving Balance

- ◆ Fluid volume control is critical for Blood Pressure (BP) management
- ◆ **Hypervolemia** can result in hypertension, left ventricular hypertrophy, congestive heart failure, myocardial infarct or a cerebrovascular accident
- ◆ **Hypovolemia** can result in hypotension, dizziness, falls, tachycardia, arrhythmia, or death



# Reasons for Managing Fluid Balance

- ◆ With End Stage Renal Disease (ESRD), a patient's kidneys can not keep fluid balanced
- ◆ Patients rely on balance to be achieved by:
  - PD ultrafiltration
  - residual kidney function (urinary output)
  - diuretics
  - adequate nutrition
  - appropriate fluid intake into body



# Considerations for Fluid Balance



- ◆ Daily physical assessment of patient's fluid status
- ◆ Monitoring fluid intake (e.g. oral, IV solutions, enteral feedings)
- ◆ Monitoring fluid losses (e.g. NPO, vomiting, diarrhea, sweating, blood loss, voiding – residual kidney function)
- ◆ Effectiveness of dialysis regimen

# Strengths of Dianeal Solutions & Average Amounts of Fluid Removed

- ◆ 0.5% - hypotonic dialysate, fluid will be drawn into blood - fluid gain per dwell
- ◆ 1.5 % - Removes the least amount of fluid per dwell
- ◆ 2.5% - May remove up to 500 mls of fluid per dwell
- ◆ 4.25% - May remove up to 1000 mls per dwell



# Assessing for Fluid Balance

## ◆ Evaluate:

- Daily weight (above or below goal weight?)
- Blood Pressure: sitting & standing or lying & sitting (postural change?)
- Cardiac status (bradycardia? tachycardia?)
- Lung sounds (crackles?)
- Respirations (SOB?, unable to lay flat?)



# Assessing for Fluid Balance (continued)

## ◆ Evaluate:

-Edema (legs, sacrum, hands, periorbital)

-Jugular vein distention

-Urinary output (still voids? anuric?)

-Serum glucose levels (high? thirsty?)

-Skin turgor



# Assessing for Fluid Balance (continued)

## ◆ Evaluate:

- Intake & Output Record

- Dialysis Record to monitor ultrafiltration and dialysis solution use (e.g. % strength of Dianeal or other specialty solutions such as Physioneal, 7.5% Extraneal or 1.1% Nutrineal)

- Current antihypertensive medications (including loop diuretics)



# Other Considerations for Assessment

- ◆ Dietary intake of fluid - recommendation:  
**Fluid intake = Urine output + 1 litre daily**
- ◆ Dietary intake of sodium
- ◆ Serum albumin level (malnutrition)
- ◆ Other disease processes such as:
  - hidden blood loss
  - gastric disturbances
  - diabetes
  - congestive heart failure



# Determining Current Fluid Status

- ◆ After assessment determine if the patient is hypovolemic, hypervolemic, or balanced
- ◆ What are the signs of hypovolemia or hypervolemia



# Signs of Hypovolemia (Dehydration)

- ◆ Low blood pressure (likely postural drop)
- ◆ Dizzy feeling
- ◆ Weight lower (than goal weight or normal)
- ◆ Cramping
- ◆ Weakness, Pallor
- ◆ Decreased skin turgor



# Treatment of Hypovolemia

- ◆ Inform Nephrologist
- ◆ Use lower strength solutions  
(e.g. 0.5% or 1.5% Dianeal or Nutrineal)
- ◆ Increase fluid intake
- ◆ Intravenous fluid bolus (if needed)
- ◆ Closely monitor weight, vitals, dialysis record, accuracy of intake & output
- ◆ Assess patient's knowledge of causes of dehydration
- ◆ Report if not resolving



# Signs of Hypervolemia (Overload)

- ◆ High BP
- ◆ Headache, dizziness
- ◆ Weigh gain >than 2 kgs or may not be elevated)
- ◆ Edema: ankles, legs, hands, sacrum, eyes
- ◆ Crackles in lungs
- ◆ Shortness of breath
- ◆ Jugular vein distention
- ◆ Chest X-ray positive for fluid



# Treatment of Hypervolemia

- ◆ Call Nephrologist
- ◆ User higher strength solutions (e.g. 2.5% or 4.25% Dianeal, ? Extraneal)
- ◆ Limit fluid and sodium intake
- ◆ Closely monitor weight, vitals, dialysis record, accuracy of intake & output
- ◆ Assess patient's knowledge of causes of fluid overload
- ◆ Re-evaluate goal weight
- ◆ Report if unresolved



# Challenges in Achieving Balance

- ◆ Peritonitis (infection)
- ◆ Failure of the Peritoneal Membrane
- ◆ Inflow and Outflow problems  
(e.g. fibrin plug, constipation)
- ◆ Malpositioned catheter
- ◆ Non-compliant patient
- ◆ Uncontrolled diabetes
- ◆ Congestive Heart Failure



# Key for Fluid Balance Management:

- ◆ Awareness of importance of maintaining fluid balance (CV risks, high mortality rate)
- ◆ Diligence in doing daily patient assessment for fluid status (especially in acutely ill)
- ◆ Knowledge of signs and symptoms of Hypo/Hypervolemia
- ◆ Use of appropriate dialysis regimen and solutions
- ◆ Monitoring diet (fluid and sodium intake)
- ◆ Collaboration when patient has challenges

# References

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