Standardizing Our Approach:
Blood Pressure in Pediatric Hemodialysis Patients

Audrey Busch, MS, RN, CNN
March 5, 2021
Agenda

- Background
  - Poll this group re BP practices
  - Show results for SCOPE BP practice result
- CV disease in Peds patients (research)
- Flynn 5th report → translating into HD patient population
- Developing the bundle – what’s in it?
  - in-center BP
  - Video of what to do vs what not to do
  - ABPM
- Implementing the bundle
  - Common fear → advice on how to get started
  - resources
Poll:
Does your unit have a concrete and standardized procedure for obtaining and recording blood pressure for hemodialysis patients?

- Yes
- No
Poll:
Are you confident that regardless of staff, blood pressure is being obtained and recorded the same on every patient every treatment??

- Not confident at all
- Slightly confident
- Fairly confident
- Completely confident
And the survey says....

- In early 2017, we surveyed pediatric 40+ dialysis clinics across the country.
- We queried them on the current and routine blood pressure practices in their dialysis center.
- Here is what we found:
How many BP measurements are *routinely* obtained on each patient pre/post-HD in your unit?
If two or more BP measurements are **routinely** obtained **post-HD**, how many minutes apart are they taken?
ABPM – Ambulatory Blood Pressure Monitoring

Is your unit **routinely** performing ABPM?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No, only HTN</th>
<th>No, only bad HTN</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

If **routinely** performing ABPM, how often?
Background

- Why is BP important in these patients
  - Research related to CV outcomes in pediatric dialysis patients
  - So we know that dialysis patients have \( ^\wedge \) risk for CVD and we take a lot of BPs but how do we know if they are good quality

- Goals of standardizing BP
  - Eventually we would like to know how to treat all of these cases but \textit{FIRST we have to know if we are even measuring correctly and uniformly.}
  - \textit{Comparing apples and oranges}
  - The aim is \textit{STANDARDIZATION,} we are not advising how to treat, simply elaborating on how to measure and when to confirm. to do. We just want to make sure we are at least gathering the right information
How it works

- Adapted from Joseph Flynns 5th reports.
- Two parts
  - In-Center BP Measurement –
    - Standardized measurement to be performed before and after every dialysis
  - Home BP Measurement
    - ABPM every 6 months
      OR
    - Twice daily home BPs for 4 consecutive days
In Center Blood Pressures

- Describe the criteria
- (site if/when possible)
Home Blood Pressures (ABPM or Home)

- Describe the criteria (site if/when possible)
- Home BP parent training document
How it looks

The GOOD
Common Concerns...And solutions

State clinic hesitations
Describe implementation tactic/strategies
resources
Restate the goal of implementing this into practice
Thank you!

Contact information

Citations (where otherwise not cited)

Picture of UCSF and Ped Neph team.
LIVE FROM THE WATER TREATMENT ROOM

Pam Heise, MSN RN CPN CNN
Assistant Director, Clinical Practice—Renal & Pheresis Department
Texas Children’s Hospital
OBJECTIVES

• Describe why water purification is important in dialysis
• Identify the contaminants of water that are toxic to dialysis patients and the associated symptoms toxicity
• Describe CMS conditional level findings related to water
• Identify the components of the water treatment room
WHY IS WATER PURIFICATION IMPORTANT IN DIALYSIS

- Drink about 2 L water each day
- Patients exposed to 200 L each treatment
- Many published instances where water has caused harm in patients
- Centers for Medicare and Medicaid services (CMS) condition for coverage (CfC)
WHAT MAKES WATER HARMFUL

• Chemicals added water to make it safe for consumption
• Exposure to large amounts is harmful

• Environmental Protection Agency (EPA) – minimum standards for drinking water
• Association for the Advancement of Medical Instrumentation (AAMI) – sets thresholds for acceptable levels of inorganic chemical contaminants in water used for dialysis treatments
## CONTAMINANTS TOXIC TO PATIENTS ON DIALYSIS

<table>
<thead>
<tr>
<th>CONTAMINANT</th>
<th>ADVERSE EVENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>Encephalopathy, bone disease, anemia</td>
</tr>
<tr>
<td>Calcium/magnesium</td>
<td>Nausea, vomiting</td>
</tr>
<tr>
<td>Chlorine/cloramine</td>
<td>Hemolysis</td>
</tr>
<tr>
<td>Copper</td>
<td>Hemolysis, nausea, vomiting</td>
</tr>
<tr>
<td>Endotoxin</td>
<td>Pyrogenic reaction, chronic inflammation</td>
</tr>
<tr>
<td>Fluoride</td>
<td>Nausea, abdominal pain, pruritus, arrhythmia</td>
</tr>
<tr>
<td>Nitrates</td>
<td>Anemia</td>
</tr>
<tr>
<td>Zinc</td>
<td>Hemolysis, nausea, vomiting</td>
</tr>
</tbody>
</table>
CONDITIONAL LEVEL FINDINGS

- Lack of knowledge or training of staff assigned to operate and monitor water treatment or Dialysate preparation
- Failure to perform and document tests for chlorine and chloramine
- Unsafe practices in preparation, labeling or delivery of Dialysate
- Failure to address out of range tests
TOUR THE WATER TREATMENT ROOM

Pre Treatment – Before RO If not treated before RO, it could damage the RO membrane

- City water
- Blending valve (blends hot and cold water)
- Backflow preventer
- Pump
- Multimedia filter
- Water softener (brine tank)
- Carbon tanks
- Ultrafiltration filters
TOUR THE WATER TREATMENT ROOM

Purification Process

• Reverse Osmosis (RO)
• Deionized tanks (DI) temporary
• Ultraviolet Light
TOUR THE WATER TREATMENT ROOM

Distribution

• Pipes
• Valves
• Regulator
TESTING AND DOCUMENTING WATER SYSTEM

• Temperature
• Multi media filter - pressure drop across the filter
  • Daily
• Water softener
  • Monthly
• Carbon beds - product water total chlorine and chloriimine
  • Before shift and q 4 hours
• Sediment/carbon control head – backwash cycler timer setting
  • Once weekly???
CULTURES AND ENDOXINS

Cultures - test live bacteria
- Acceptable level: <50 colony forming bacteria (CFU)
- Action level: 50 CFU/mL-199 CFU/mL (can complete treatments for the day)
- Unacceptable level: >=200 CFU/mL (must stop treatments)

Endoxins -
- Acceptable level: <1 Endotoxin Units (EU)
- Action level: >=1 EU to <2 EU
- Unacceptable level: >=2 EU
Quality of Life
Round Table Discussion

Kelli Scott, LCSW, LMSW
Disclosures

I have no disclosures.
Tools Used

- Core Version
- ESRD Specific
CMS Requirements

• Completed within first 30 days and at least annually there after
• Completed if patient experiences a life changing event or change in health status
Areas Assessed

• Physical
• Emotional
• Social
• School/Work
Scoring

• Will add picture of scoring scale compared to general population
Questions???

What questions do you have about the PedsQOL?

Have you come across concerns after QOL is completed?

For those that have experience with tool, how has it improved patient care?

How have you dealt with any identified concerns after the QOL is completed?
References

• Pedsql.org