
Pamela Kent MS, RD, CDE, CSR, LD
1. Increase the number of patients who report taking their binders.
2. Lower the facility’s aggregate phosphorus rate.
What is “Adherence”? 

- Adherence: the extent to which a patient’s behavior coincides with medical or prescribed health advice. (Julius 2009)

- Medication adherence: the level of participation achieved in medication regimen once an individual had agreed to the regimen. (Balkrishnan 2005)
Basic Model of Barriers to Adherence

Healthcare System Factors

Provider Factors

Patient Factors
Causes of Elevated Serum Phosphorus in Stage 5 CKD

Vitamin D
Calcitriol
Inadequate Dosing Of Phosphate Binders
pH ↓ HCO$_3$ ↓
Inadequate Dialysis
Tetracycline
Prednisone Tablets
KDOQI: Treatment for Hyperphosphatemia

Diet
- Dietary phosphorus should be restricted to 800 – 1,000 mg/day (adjusted for dietary protein needs) when serum phosphorus levels are > 5.5 (stage 5)¹

Binders
- Calcium-based binding agents¹
  - Total dose of elemental calcium from binders should not exceed 1,500 mg/day¹
- Noncalcium-, nonaluminum-, nonmagnesium-containing phosphate binding agents¹
  - Preferred in dialysis patients with vascular and/or soft tissue calcification¹
- Aluminum-based binding agents¹
  - Used as a short-term therapy (4 weeks) and for one course only, when phosphorus > 7 mg/dL¹

Dialysis
- HD removes ~ 800 mg per treatment¹
- PD removes ~ 300-315 mg per day¹

D hormone - Hold dose when phosphorus > 6 mg/dL¹
- Restart at a lower dose when phosphorus < 5.5 mg/dL¹

Beware: Hidden Sources of Phosphorus

Phosphorus Additives:

Highly absorbable¹

A study found that consuming foods containing phosphate additives increased the individual’s phosphorus intake by an average of 1100 mg per day.²

- In 1990, phosphorus-containing food additives contributed approximately 470 mg of phosphorus per day to the daily diet³

Increasing demand for convenience and fast food products will continue to increase the daily contribution to phosphorus intake from phosphate additives⁴

Difficult to assess actual phosphorus content

- No requirement for phosphorus content to be on food label
- Nutrient composition tables usually do not include the phosphorus from additives, resulting in an underestimation of the dietary phosphorus intake³

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## Phosphate Binders Prescribed to treat CKD-MBD

<table>
<thead>
<tr>
<th>Tablet/Capsule</th>
<th>Tablet/Capsule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Velphoro 500 mg</td>
<td>Calcium Acetate 668 mg tablet</td>
</tr>
<tr>
<td>Renagel 800 mg</td>
<td>Tums 500 mg chewable</td>
</tr>
<tr>
<td>Renvela 800 mg</td>
<td>Tums Extra 750 mg chewable</td>
</tr>
<tr>
<td>Renvela 0.8 g or 2.4 g powder</td>
<td>Tums Ultra 1000 mg chewable</td>
</tr>
<tr>
<td>Fosrenol 500 mg chewable</td>
<td>Caltrate 600 mg tablet</td>
</tr>
<tr>
<td>Fosrenol 750 mg chewable</td>
<td>0s-Cal 500 mg tablet</td>
</tr>
<tr>
<td>Fosrenol 750 chewable</td>
<td>Phosylra 667 mg/5 mL</td>
</tr>
<tr>
<td>Aeryxia 210 mg tablet</td>
<td>Calcium Carbonate 1250 mg/5 ml</td>
</tr>
<tr>
<td>Calcium Acetate 667 mg tablet</td>
<td>Amphogel liquid</td>
</tr>
<tr>
<td>Calcium Acetate 667 mg capsule</td>
<td>Alternagel liquid</td>
</tr>
</tbody>
</table>
Reasons Given for Missing Phosphate Binder Doses

129 hemodialysis and 59 peritoneal dialysis patients were surveyed

**Patient-reported Reasons**

- Unaware of correct prescription: 37%
- Forgot: 30%
- Dining out: 8%
- Too many pills: 6%
- Too big to carry: 4%
- GI upset: 4%
- Other: 9%

Components of Medication Nonadherence

Patients are reluctant to take medications.

Deviations from prescribed regimens in the literature

- 7% - 20% do not fill Rx
- 15% discontinue medication too soon
- 32% - 60% fail to refill prescriptions

Adherence usually decreases over time.

Rates of Adherence in the U.S.

- It is estimated that the rate of nonadherence to any medication regimen is between 15% & 93%, with an average estimated rate of nonadherence at 50%. (Balkrishnan 2005, Balkrishnan & Jayawant 2007)

- 33% to 69% of all medication-related hospital stays are thought to be due to medication nonadherence.
Patient Safety: Medication Errors

“How would you take this medicine?”

395 primary care patients in 3 States

- 46% did not understand instructions ≥ 1 labels
- 38% with adequate literacy missed at least 1 label

## Patient Reasons for Non-Adherence

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of the drug</td>
<td>40%</td>
</tr>
<tr>
<td>Side effects of drug</td>
<td>11%</td>
</tr>
<tr>
<td>Thought drug wouldn’t help much</td>
<td>11%</td>
</tr>
<tr>
<td>Didn’t think I needed it</td>
<td>8%</td>
</tr>
<tr>
<td>Drug did not help</td>
<td>6%</td>
</tr>
<tr>
<td>Don’t like taking prescription drugs</td>
<td>5%</td>
</tr>
<tr>
<td>Condition improved</td>
<td>4%</td>
</tr>
<tr>
<td>Already taking too many prescriptions</td>
<td>3%</td>
</tr>
</tbody>
</table>

*Source: AARP, 2004*
The patient has poor understanding of...

- the disease
- the benefits and risks of treatment
- side-effects
- proper use of the medication
- complex medical regimen
Mismatched Communication

**Clinician Process**: Giving information

**Patient Process**: Understanding, remembering, and acting on information
The chronic care model is proactive vs. reactive and focuses on keeping a person as healthy as possible.
## Contrast between acute and chronic illness

<table>
<thead>
<tr>
<th></th>
<th><strong>Acute Illness</strong></th>
<th><strong>Chronic Illness</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration of disease</strong></td>
<td>Short</td>
<td>Long-term – may be lifelong</td>
</tr>
<tr>
<td><strong>Goal of treatment</strong></td>
<td>Cure – return to normal life</td>
<td>• Adapt to a changed life</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Manage day-to-day symptoms</td>
</tr>
<tr>
<td><strong>Patient’s role</strong></td>
<td>Comply with the treatment plan</td>
<td>Self-manage treatments, diet, medications, etc.</td>
</tr>
<tr>
<td><strong>Staff’s role</strong></td>
<td>Provide medical care</td>
<td>• Provide medical care</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Prepare patients to self-manage</td>
</tr>
</tbody>
</table>
Definition of Patient Engagement

Patient activation: patient’s knowledge, skills, ability, and willingness to manage his or her own health and care.

Steps to Patient Engagement

- Engage me
- Partner with me
- Empower me
- Support Me
- Involve me
- Inform me
Outcomes of Patient Engagement and Activation

1. Patient starts to take a role
2. Patient builds confidence and knowledge
3. Patient takes action
4. Patient maintains behaviors
Medication Regimen Review

1. Obtain accurate medication list
2. Evaluate necessity of each medication
3. Determine whether each medication is the optimal choice
4. Assess dosage and dosing regimen
5. Review the medication list for interactions, adverse effects
6. Ensure proper monitoring
7. Assess medication adherence
8. Update medication list in record

HEALTH LITERACY
Behavior Change, Adult Learning, and Health Literacy Principles

Improve knowledge and skills and change behavior

Educator’s Toolbox

- Illustrations and Models
- Practical Support Tools
- Story Telling
- Interactive Tools
- Modeling Behavior
- Analogy
- Skill Building Exercises

CONFIDENCE
Health literacy is defined as “the ability to find, understand, and use basic health information and services needed to make appropriate health decisions.”

- Poor knowledge of chronic conditions
- Worse health outcomes
- More hospitalizations
- More frequent use of emergency rooms
- Higher rates of medication error

50% of the US population may be at risk
Health Literacy: Considerations

Health literacy considers a person’s knowledge and skills:

- Reading
- Writing, listening, speaking, arithmetic
- Visual
- Conceptual

Adult learners with low literacy may:

- Take words or instructions literally
- Read slowly and miss meanings
- Skip over hard or uncommon words
- Get lost in details
- Have difficulty finding focus

Self-care in managing health
Adult Health Literacy Experience

GNINAELC – Ot erussa hgih ecnamrofrep, yllacidoirep naelc eht epat sdaeh dna natspac revenehw uoy eciton na noitalumucca fo tsud dna nwort-der edixo selcitrap. Esu a nottoc baws denetsiom htiw lyporposi lohoca. Eb erus on lohocl sehtcuot eht rebbur strap, sa ti sdnet ot yrd dna yllauteve kcarc eht rebbur. Esu a pmad tholc ro egnoe ot naelc eht tenibac. A dlim paos, ekil gnihsawhsid tnegreted, lliw pleh evomer esaerg ro lio.
<table>
<thead>
<tr>
<th><strong>ALBUMIN</strong></th>
<th><strong>enPCR</strong></th>
<th><strong>spKt/V</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein in my blood that helps fight infections and aid in healing.</td>
<td>Suggests if I am eating enough fish, chicken, beef, eggs and other protein foods.</td>
<td>This value is one of the numbers that tells me if I am getting enough dialysis to clean my blood.</td>
</tr>
<tr>
<td><strong>Goal is</strong></td>
<td><strong>Goal is</strong></td>
<td><strong>Goal is</strong></td>
</tr>
<tr>
<td>Higher (No recent result)</td>
<td>1.1 or Higher (No recent result)</td>
<td>1.2 or Higher (No recent result)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>POTASSIUM</strong></th>
<th><strong>HEMOGLOBIN</strong></th>
<th><strong>PHOSPHORUS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>This mineral is needed for normal heart and muscle action. Too much can make my heart stop.</td>
<td>Contains iron and carries oxygen from my lungs through my body.</td>
<td>The right amount helps keep my bones strong and my heart healthy.</td>
</tr>
<tr>
<td><strong>Goal is</strong></td>
<td><strong>Goal is</strong></td>
<td><strong>Goal is</strong></td>
</tr>
<tr>
<td>3.5 to 6.0 (No recent result)</td>
<td>10.0 to 11.0 (No recent result)</td>
<td>3.0 to 5.5 (No recent result)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>CALCIUM, TOTAL</strong></th>
<th><strong>IPTH</strong></th>
<th><strong>AVERAGE FLUID WEIGHT GAINS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>A mineral needed for healthy bones and muscles.</td>
<td>Balances calcium and phosphorus in my blood. High phosphorus can cause high IPTH and lead to bone and heart damage.</td>
<td>Monthly</td>
</tr>
<tr>
<td><strong>Goal is</strong></td>
<td><strong>Goal is</strong></td>
<td><strong>kg</strong></td>
</tr>
<tr>
<td>8.5 to 10.0 (No recent result)</td>
<td>150 to 300 to 150 to 600 (No recent result)</td>
<td>At Goal</td>
</tr>
<tr>
<td>Above Goal</td>
<td>Above Goal</td>
<td><strong>kg</strong></td>
</tr>
</tbody>
</table>
Universal Communication Principles

- Everyone benefits from clear information.
- Many patients are at risk of misunderstanding but it is hard to identify them.
- Testing reading levels does not ensure patient understanding in the clinical setting.
TEACH-BACK
Communicating Information

- 40 – 80% of the medical information is forgotten immediately
- Nearly half of the information retained is incorrect
- One of the easiest ways to close the gap of communication between patient and clinician is use the “teach-back” method.
What is it?

Teach-back:

1. Confirms you have explained to the patient what they need to know in a manner that the patient understands.

2. Patient understanding is confirmed when they explain it back to you.
Why do I use it?

Adult learners...

10% of what they read
20% of what they hear
30% of what they see
50% of what they see and hear
70% of what they say
90% of what they say and do
When do I use it?

Research show that patients remember and understand less than half of what clinicians explain to them.
How do I use it?

“Tell me what you’ve understood.”

“I want to make sure I explained your BP medicine clearly. Can you tell me how you will take your medicine?”

Do you understand?
Do you have any questions?
"Show Me How Many Pills You Would Take in 1 Day"

John Smith        Dr. Red

Take two tablets by mouth twice daily.

Humibid LA       600MG
1 refill
Rates of Correct Understanding vs. Demonstration “Take Two Tablets by Mouth Twice Daily”

Correct (%)

Low | Marginal | Adequate
---|---|---
71 | 84 | 89
35 | 63 | 80

Summary: Teach-back

Always:

1. Use Plain language
2. Slow down
3. Break it down into short statements
4. Focus on the 2 or 3 most important statements
5. Check for understanding using teach-back
MOTIVATIONAL INTERVIEWING: HELPING PEOPLE CHANGE
Making Lifestyle Changes

Many adults want to make lifestyle changes but are unable to do so.

A "lifestyle" is more than the way we spend our time!
- “Lifestyles” are the behaviors that we adopt based on the context of our life circumstances.

Takes time to change. It is hard work.
Research shows that people advance through a series of stages as they attempt to change behaviors. At what stage are your patients?
What tips the balance **against** change?

- Lecturing, arguing, warning
- Overly directive
- Telling patient what to do before they are ready
- Trying to insert information into the patient
- You working harder than the patient
The more a person feels “pushed” to move in a certain direction the more likely they will push back.
## Importance and Confidence Rulers

On a scale of 0 to 10, how IMPORTANT is it for you right now to change?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extremely Important</td>
</tr>
<tr>
<td></td>
<td>Important</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Important</td>
</tr>
</tbody>
</table>

On a scale of 0 to 10, how CONFIDENT are you that you could make this change?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extremely Confident</td>
</tr>
<tr>
<td></td>
<td>Confident</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Confident</td>
</tr>
</tbody>
</table>
GOAL SETTING
SLAM-able Goals

(S)pecific = Know what your trying to do

(L)imited = Work on a few goals at a time

(A)chievable = Make sure you can reach your target

(M)easurable = Keep track of your progress
SUMMARY
Patient Education: What We Know

- Written materials, when used alone, will not adequately inform.
- Patients prefer receiving key messages from their clinician with accompanying pamphlets.
- Focus needs to be “need-to-know” & “need-to do”
- Patients with low literacy tend to ask fewer questions.

Lessons Learned From Patients

Break it down for me:

1. What it is for
2. How to take (concretely)
3. Why (benefit)
4. What to expect

Remember: what’s clear to you is clear to you!
Medication Adherence Evidence-Based Conclusions

Multicomponent interventions best for adherence and health outcomes:

1. Seek regimens with the fewest side effects
2. Simply regimens, provide reminders and information
3. Encourage self-monitoring of pill-taking behavior
4. Attention from providers, problem-solving
What should you ask...

Some questions to ask at each visit to assess adherence include:

1. Are you having any problems or side effects with your medication?
2. Are you having trouble paying for any of your medications?
3. About how often do you miss taking a dose?
4. How happy are you with your current treatment plan?
5. How can I help you the most?
Phosphorus is out of range – what do I do?

Phosphorus is below target
- Reduce dose of phosphate binders
- Assess nutritional intake, liberalize dietary intake

Phosphorus is above target
- Limit dietary phosphorus and reinforce low phosphorus education\(^1\)
- Assess phosphate binder adherence and adjust dose if necessary\(^2\)
- Assess iPTH level\(^2\)
- Reduce or discontinue vitamin D analog\(^3\)
- Consider dialysis modalities that allow an increase in phosphate removal in the treatment of persistent hyperphosphatemia\(^3\)

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10 Tips to Stay Adherent

1) Set a daily routine
2) Create a calendar checklist to record taking your doses
3) Use sticky note reminders
4) Count the pills in you bottle
5) Obtain a pill box organizer
6) Set an alarm
7) Use technology – pill reminder apps
8) Enlist help from your partner
9) Refill orders – mark your calendar
10) Ask your pharmacist to schedule your refill dates at the same time
“If they don’t do what we want, we haven’t given them the right information.”

Vice Admiral Richard Carmona
Former Surgeon General