

Title **PHOSPHATE IV REPLACEMENT PROTOCOL (NON-CRITICAL CARE)**

Outcome Goal Asymptomatic patients with hypophosphatemia will receive IV phosphate replacement based on this protocol.

Team Member Responsibilities **RN:** Initiate phosphate protocol when ordered by the physician.
Pharmacy: Monitor lab values and place protocol on medication administration record when needed.

Supportive Data Phosphorus is an essential macromineral in human nutrition and plays pivotal roles in the structure and function of the body. Phosphorus is essential for the process of bone mineralization and makes up the structure of bone. Approximately 85% of phosphorus in the adult body is in bone. Phosphorus in the form of phospholipids makes up the structure of cellular membranes. It also makes up the structure of nucleic acids and nucleotides, including adenosine triphosphate, among other things. Normal levels of phosphate are 2.4-4.5 mg/dl.

Phosphorus, mainly in the form of phosphates, is widely distributed in the food supply, and phosphorus intake from the normal diet is usually sufficient to meet the body's phosphorus needs. Milk and milk products are particularly rich sources of phosphorus. One liter of milk contains about 1,000 milligrams of phosphorus. Phosphorus deficiency states, however, do occur but usually they are caused by some disease process. For example, those with malabsorption syndromes and those with diseases causing renal tubular losses of phosphorus can become phosphorus depleted. In addition, those with malnutrition, alcoholics and critically ill patients, such as those being treated for diabetic ketoacidosis, are at risk for phosphorus deficiency, as well as phosphorus imbalance.

Phosphorus deficiency can result in anorexia, impaired growth, osteomalacia, skeletal demineralization, proximal muscle atrophy and weakness, cardiac arrhythmias, respiratory insufficiency, increased erythrocyte and lymphocyte dysfunction, susceptibility to infectious rickets, nervous system disorders and even death. Replacement can occur with oral or parenteral phosphorus. Potential risk associated with high doses and rapid administration include: hypocalcemia, hypotension, metastatic calcification, and renal failure.

Policy or Guidelines A physician order is required for a phosphate protocol to be initiated. Orders for "phosphate protocol" for any patient in a non-critical care bed will have this protocol entered into their medication profile.

If a patient is able to take PO and can absorb oral phosphorous, the patient should have oral replacement of phosphorous.

Labs. The following labs should be obtained daily until phosphorus level of 2.6 or more is reached:

- Phosphorus
- Magnesium
- Chem-12

Contraindications. The following patients will not be dosed according to this protocol:

- Patients weighing less than 50kg.
- Patients with estimated creatinine clearance less than 30ml/min (or BUN greater than 80).
- Calcium Level less than 7.5 or greater than 11.0 (when corrected for low albumin).
- Magnesium Level less than 1.5 (unless patient is on magnesium protocol and magnesium replacement is given before phosphate replacement).
- **NOTE:** For patients with any of the exclusions listed above, the physician will be contacted to assess appropriateness of therapy and/or dose.



Clinical Practice Standards

Section: Protocols
 Number: 1.9
 Revised: 11/05
 Effective: 4/06

Title

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Transfer Orders: patients transferring from a critical care bed on the Phosphate Protocol will be switched to this protocol if the physician renews the phosphate protocol upon transfer.

KCI Protocol Patients receiving Potassium Phosphate and requiring KCI supplementation that same day will have their KCI per protocol reduced by the following amount:

Amount to Reduce KCI Protocol Supplementation	
<i>If Patient Receives:</i>	<i>Reduce Today's KCI Protocol Dose by:</i>
30mMols K-Phosphate	40mEq
15mMols K-Phosphate	20mEq

Pharmacy will review lab results and replace phosphate if needed in the appropriate form (sodium or potassium), and will follow the designated parameters. The replacement doses will be prepared in the correct volume of the appropriate solution. Pharmacy will continue to follow the protocol until the physician writes an order to discontinue the protocol.

The dilution listed below is suitable for peripheral or central lines.

PHOSPHATE REPLACEMENT					
Phosphorus Level	Phosphorus Dose	Potassium Level	Sodium Level	Dilution	Infusion Duration
1.5 – 2.5	15mMols	<i>Less Than 4.0</i> Give KPhos	n/a	250ml NS or D5W	8 hours
		<i>4.0 or more</i> Give NaPhos	More than 145, call physician		
<i>Less than 1.5</i>	30mMols	<i>Less Than 4.0</i> Give KPhos	n/a	500ml NS or D5W	12 hours
		<i>4.0 or more</i> Give NaPhos	More than 145, call physician		

Equipment / Supplies

Infusion Pump
 Premixed Medication

Procedure

Phosphate Administration

Step	Action
1	Obtain physician's order for Phosphate Protocol.
2	Review labs and contraindications listed in policy section to determine if this patient is appropriate for IV phosphate replacement.
3	Follow the Phosphate Replacement table (above) to determine dose and infusion duration.
4	Contact the pharmacy with questions regarding the preparation of the phosphate.
5	Monitor patient for side effects to phosphate administration.

Patient / Family Education

Educate patient/family about need for and importance of phosphate replacement.

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Documentation Document phosphorus administration on the medication administration record. Document patient tolerance in the nurses' notes.

Related Procedures Critical Care Policy and Procedure:
1.8 Trauma Service IV Phosphate Replacement Protocol

References PDR Health.Phosphorous. Retrieved on November 2nd, 2005 on
http://www.pdrhealth.com/drug_info/nmdrugprofiles/nutsupdrugs/pho_0203.shtml

ISMP Phosphorus Protocol Checklist. Retrieved on November 28th, 2005 on
<http://www.ismp.org/MSAarticles/PhosProtocol.html>

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