55 yo F with Hypertensive Emergency

Endorama #2 March 10, 2016
Mizuho Mimoto

CC/HPI:

- 55yo F presents to the ED with SOB, chest pain, headache, vision changes and finger-tip paresthesias.
- VS: T 96.8, HR 87, 218/117, SpO2 100% on 2L nc
- Admitted to CCU for labetalol gtt

ROS

Constitutional: No fevers, chills, night sweats, weight changes
Vision: No photophobia, **blurred vision**, no pain/discharge
ENT: No voice changes, sore throat, difficulty swallowing
CV: **+Chest pain**, no orthopnea, PND, LE edema
Pulm: +dyspnea, wheezing, cough
GI: +nausea. No abdominal pain, vomiting, diarrhea, constipation, melena or hematochezia
GU: No frequency, dysuria, hematuria, discharge
ENDO: **+Heat intolerance**
MSK: **+Myalgias, LE spasms**
Neuro: +HA, paresthesias. No tremor, numbness, paresthesias
Skin: No rash, jaundice, lesions.
Psych: Anxious
Heme: no bleeding/bruising

Physical Exam

Vitals: **T 96.8, HR 87, 218/117, SpO2 100% on 2L nc**
General: Moderate Distress
Eyes: No conjunctival pallor or injection, no icterus
ENT: No nasal discharge, O/p membranes moist, no exudates.
Cardiac: RRR, no murmurs, **3+ peripheral pulses**, no LE edema, JVP not elevated.
Pulm: Clear bilaterally with adequate effort
GI/Abd: Normoactive bowel sounds, not visibly distended, non-tender, no rebound, no hepatosplenomegaly
GU: No CVA tenderness or suprapubic tenderness
MSK: Normal bulk and tone, no joint effusions or major deformities
Skin: No rash or bruises. Adequate capillary refill.
Neuro: AAO x 4, PERRL, EOM normal, 5/5 strength in all major muscle groups; reflexes normal throughout
Psych: agitated, anxious, but cooperative

Past Medical History

PMH
- HF (EF 30%)
- CKD V (GFR 10-20)
- Bipolar d/o
- Polysubtance abuse (cocaine)
- CVA
- Epilepsy

PSH
- Parathyroidectomy

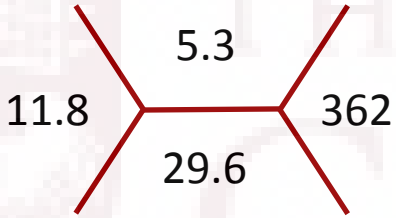
Medications
- Tylenol #3
- Percoset
- Allopurinol 200 mg
- ASA 81
- ?OsCal

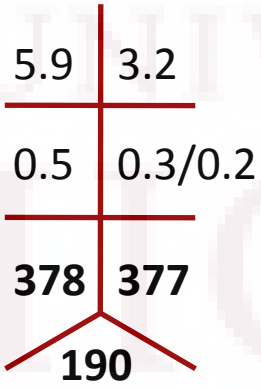
Allergies: Phenobarbital, Phenytoin, Strawberry

Family Hx
- No significant FH

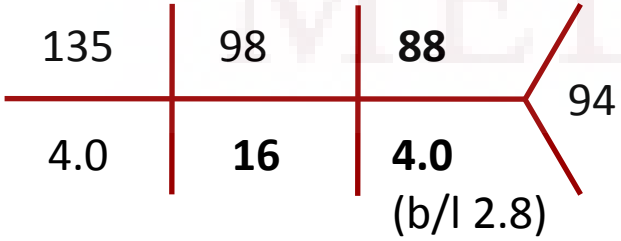
Social Hx
- Tobacco
- Cocaine
- Prior EtOH (quit 25 y ago)

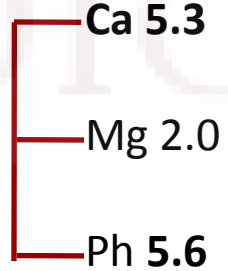
PATIENT LABS





CK 704
CKMB 1.1
Trop 0.04
proBNP 45,556



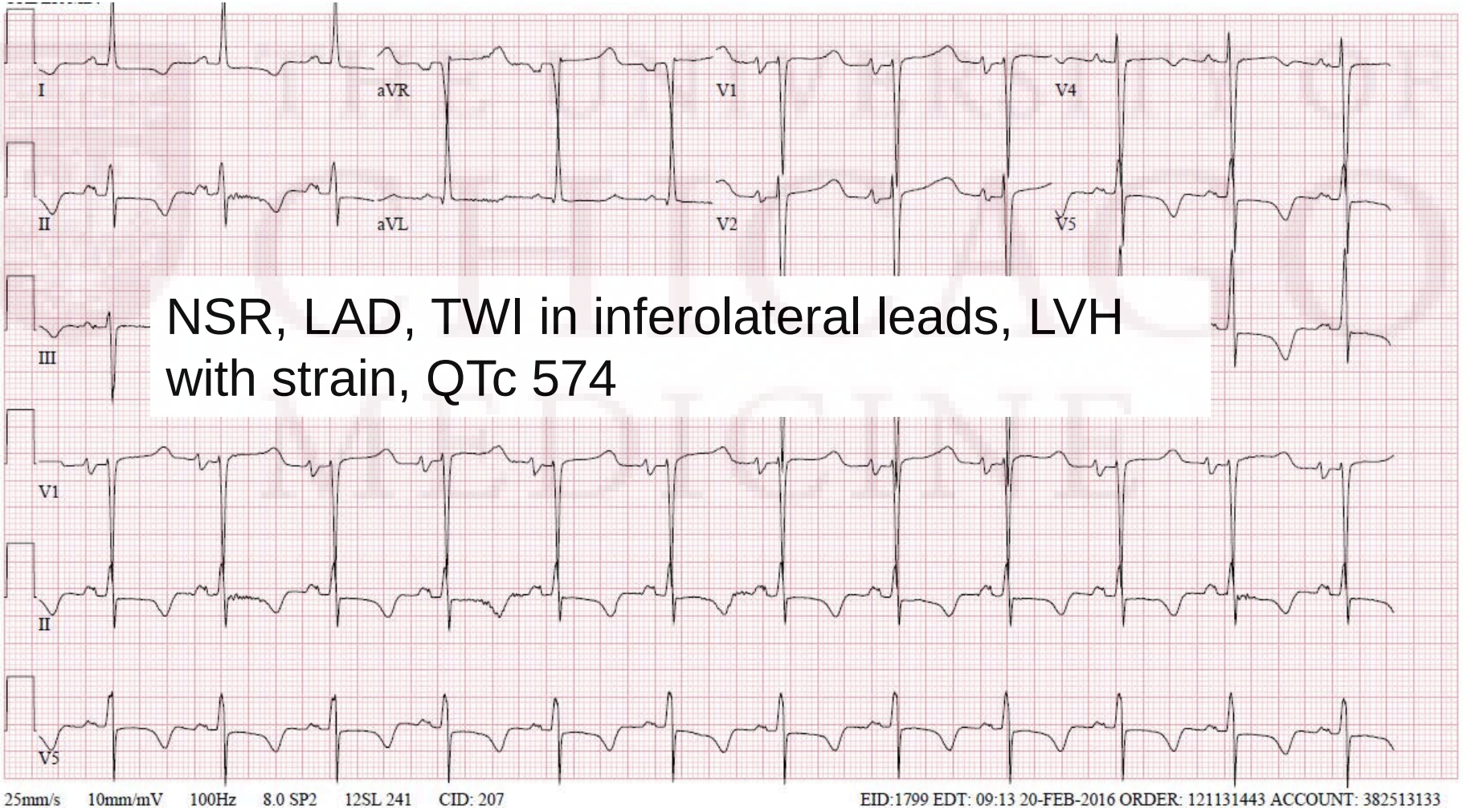


iCal 2.4

PTH 118
25OHD: pending

Utox: Cocaine+

EKG



NSR, LAD, TWI in inferolateral leads, LVH with strain, QTc 574

What would you like to do next?

When to treat hypocalcemia with a gtt?

Indications for gtt:

- Symptomatic Hypocalcemia (carpopedal spams, tetany, laryngospasm seizures)
- QTc prolongation
- Acute decrease in calcium (≤7.5 mg/dL)
- Unable to take po

Consider po supplementation:

- Paresthesias
- Calcium ≥7.5

Uptodate

Endo Society Hypoparathyroidism: Summary Statement and Guidelines 2016

Logistics:

Endo society guidelines recommend:

- **1-2 ampules of 10% calcium gluconate (90-180 mg elemental Ca) in 50 mL D5 Followed by 0.5-1.5 mg/kg/hr over 8-10 hours**
- **Ensure magnesium replete >2.0 as deficiency will prevent PTH release and promote resistance.**

67kg → 33.5-100.5 mg/hr

Pharmacy stock: 7.5 g Ca gluconate/150cc = **4.5mg/mL** elemental calcium
For 0.5mg/kg/hr would need 33.5 mg = **7.4 mL/hr.**

OR

1mg/mL (0.1%) solution elemental calcium (11 g calcium gluconate = 990 mg elemental Ca) to final volume 1L NS or D5→ **33.5 cc/hr**

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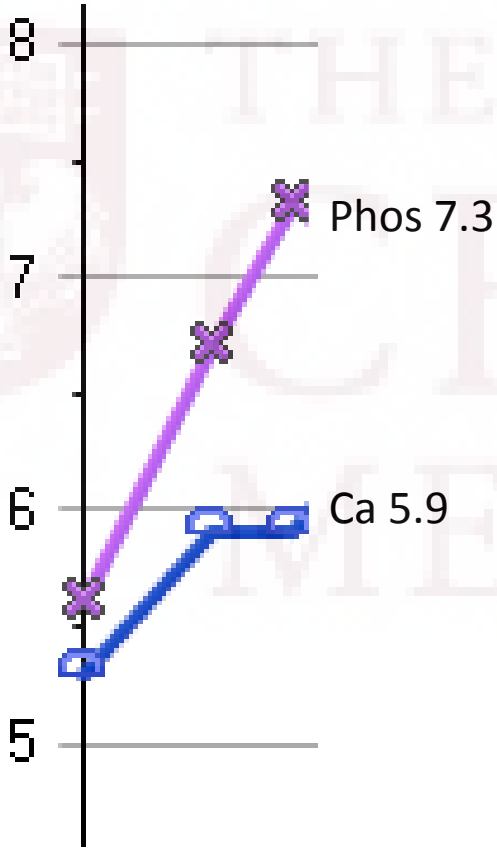
Calcium and Phosphorus trend



Graph Legend

- Calcium
- Inorganic Phosphate

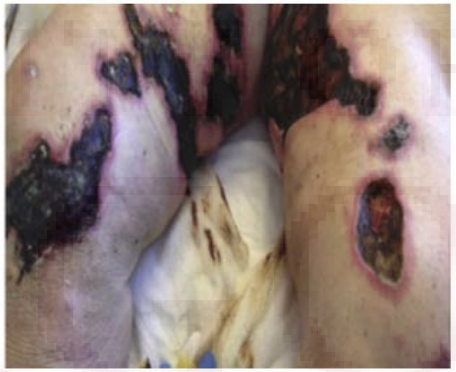
Ca x Phos product = 43

Concern that she may need HD

Agitated, confused, pulling out IVs

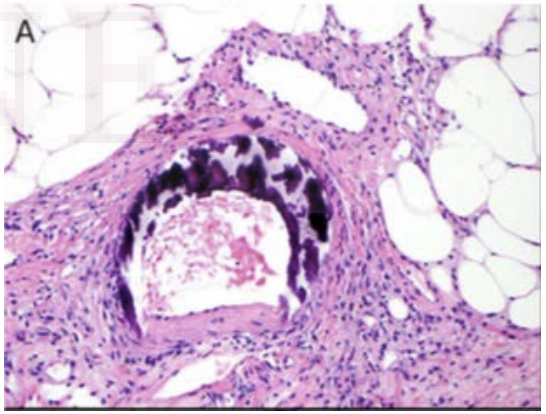
Calciphylaxis

Calciphylaxis: Extraosseous calcification involving skin and subcutaneous tissue



Systemic medial calcification of the arterioles that leads to ischemia and subcutaneous necrosis

The term "calciphylaxis" is a misnomer, first used to describe an anaphylactic reaction observed in an animal model



Preferred term: Calcific uremic arteriolopathy (CUA); can also have non-uremic calciphylaxis (even more rare)

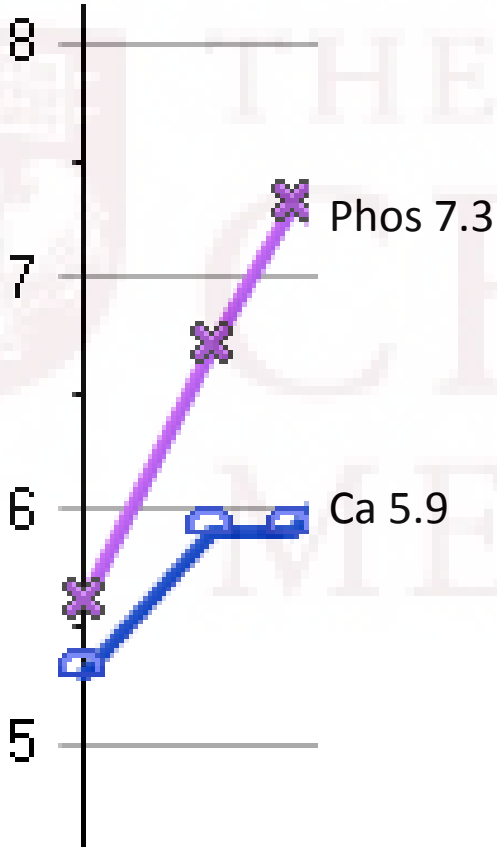
Sagar et al. Am J Kidney Dis. 2015;66(1):133-146

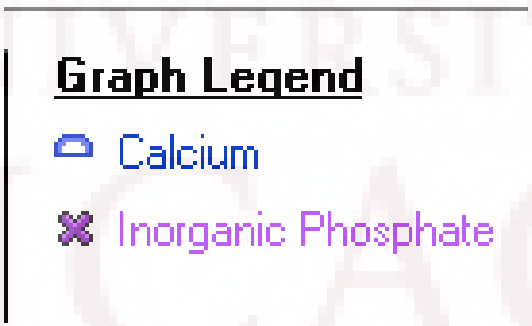
What is the risk of calciphylaxis

- Occurs mainly in ESRD and in renal transplant patients (1-4%)
- Associated conditions:
  - Uremia
  - Hyperphosphatemia
  - Hyperparathyroidism
  - Calcium-based phosphate binders
- Calcium phosphate product above 70 mg2 /dl2 (not required)

- **Other risk factors**:
- Aluminum excess, obesity, alcoholic liver disease, systemic glucocorticoids

Calcium and Phosphorus trend





Ca x Phos product = 43

Concern that she may need HD

What about rPTH?

Role of recombinant PTH in acute hypocalcemia

Per Guidelines – insufficient data to recommend use in acute hypocalcemia
Case reports only

Approved use:

- Adults with osteoporosis
- 20 mcg/day

Two trials for patients with chronic hypoparathyroidism

- 20 weeks and 3 years follow up
- Up to 80 mcg/day, bid dosing better due to short $T_{1/2}$
- Over 50% in the treatment arm achieved:
  - →50% reduction in Ca and active vitamin D supplements
  - →maintenance of serum Ca

Ghada T Ballane et al. Eur J Endocrinol 2012;166:1113-1120

Role of recombinant PTH in acute hypocalcemia

	Day 1	Day 8
Total serum calcium (mg/dl)	3.7	7.5
Inorganic phosphate (mg/dl)	17.6	5.6
Albumin (g/l)	46	
Magnesium (mg/dl)	1.7	1.6
Creatinine (mg/dl)	1.8	0.9
Ionized calcium (mmol/l)	0.54	1.09
PTH (pg/dl)	8.6	
25-OH-vitamin D (ng/ml)	22.2	
$1,25(OH)_2$-vitamin D (pg/ml)	46.90	
Troponin T (ng/ml)	0.022	0.007
CK-MB (µg/l)		3.0
TSH (µIU/ml)	2.460	
CPK (IU/l)	7137	95
LDH (IU/l)	634	

56 yo F admitted with new HF
EF 25-30%, PAP 47mmHg
Convulsions
Hypocalcemia
Severe carpopedal spasms

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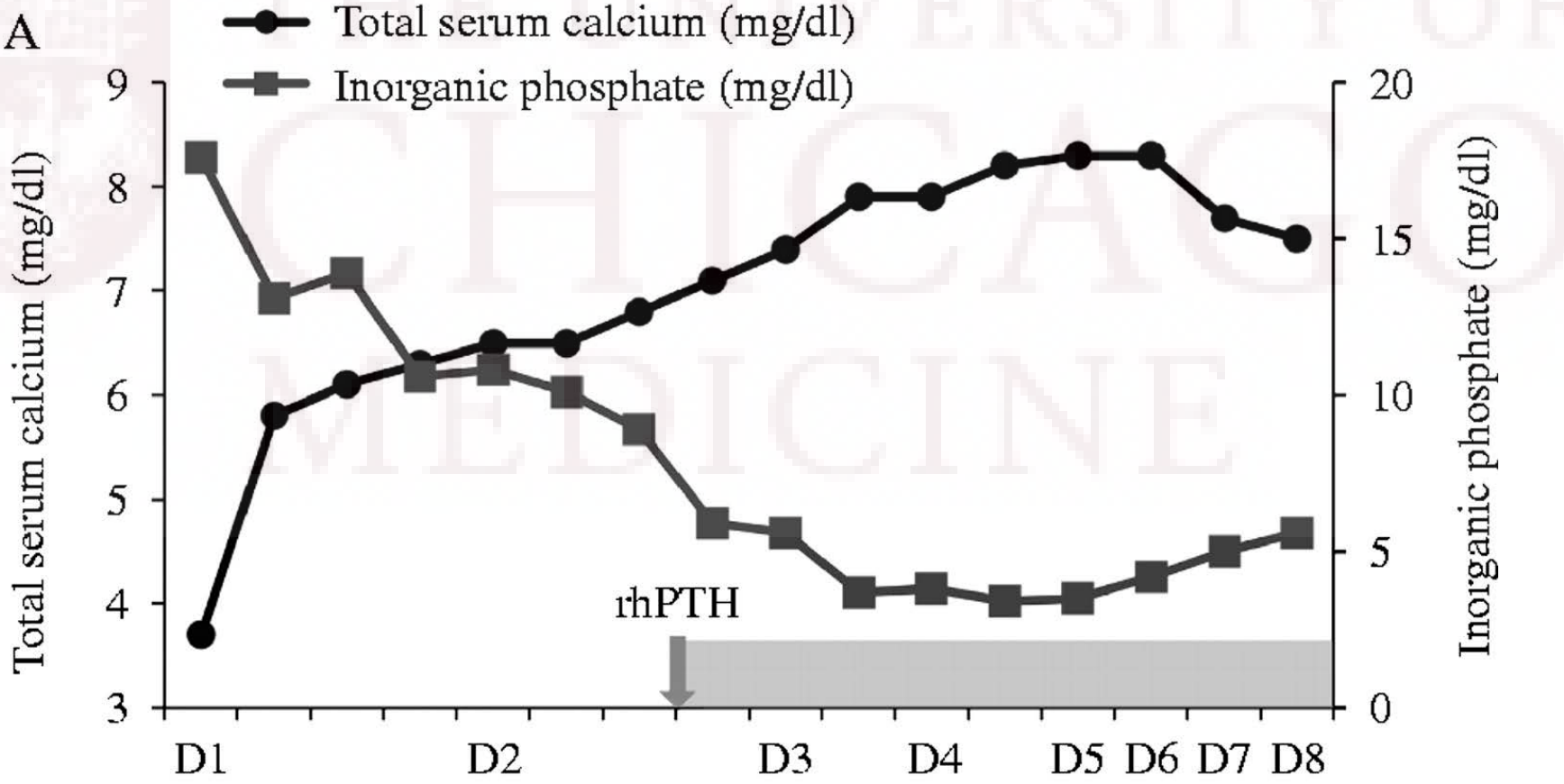
Recombinant PTH



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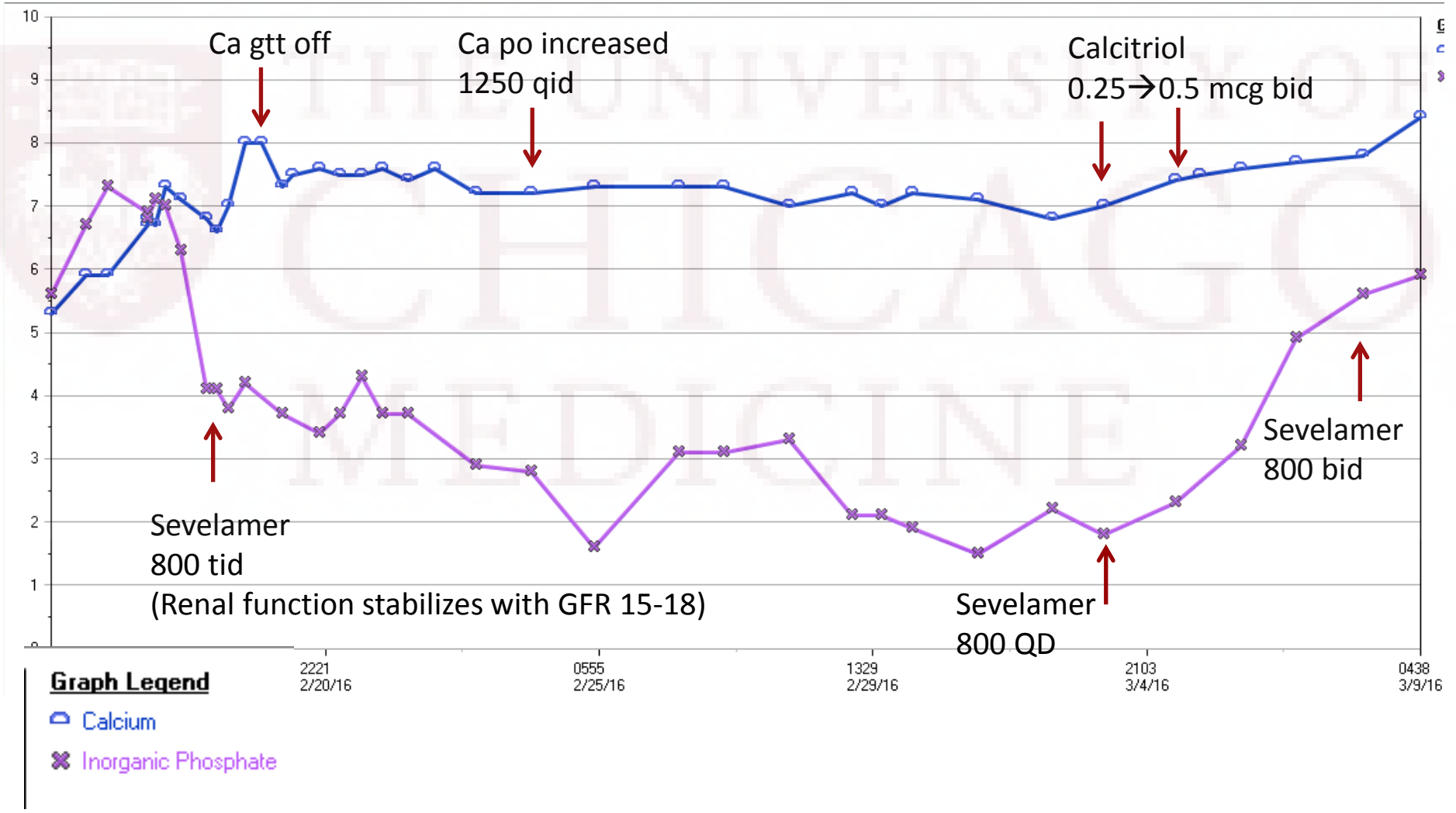
Calcium and Phos over the course of admssion



Goals of chronic therapy

1. Prevent signs and symptoms of hypocalcemia
2. Maintain the serum calcium concentration slightly below normal (>7.9)
3. Maintain the calcium x phosphate product to below 55 mg^2 dL^2
4. Avoid hypercalciuria
5. Avoid hypercalcemia
6. Avoid renal (nephrocalcinosis / nephrolithiasis) and other extraskeletal calcifications

Patient course:

"patient was originally certified by has now been initiated on and continued taking her depakote and quetiapine as scheduled with marked improvement in her thought process and mood. Patient no longer requires inpatient psychiatric hospitalization"

Discharged on:

- Calcium carbonate 1250 mg QID (2g elemental calcium)
- Calcitriol 0.25 mg bid
- Vitamin D3 4000 Units daily

Repeat labs early next week
Follow up in clinic 3/22

References

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