CalOPT: Optimizing Calcium Intake

J. Cerulli [1,2], A. Roberts[1,2], E. Wilson[2], S. Guisinger[2]

[1]Price Chopper Specialty Pharmacy, [2] Price Chopper/Market 32 Supermarkets

BACKGROUND

- 38% of Americans do not meet the Recommended Daily Allowance (RDA) for calcium intake [1,2]
- Americans get about half the recommended amount of calcium in diet [3]
- This is concerning for specialty pharmacy patients prescribed osteoporosis therapy or medications that increase bone loss
- Baseline assessments completed during 20 welcome calls indicated 55% of our patients had calcium intake < 600mg per day
- This confirmed the need for a comprehensive intervention developed by nutrition and pharmacy services to optimize calcium intake among specialty pharmacy patients

GOALS & OUTCOMES

Primary goal and outcome: To increase the percentage of targeted specialty pharmacy patients achieving goal RDA calcium intake (1000-1200mg) by 20% through a collaborative intervention between a specialty pharmacy and a registered dietitian-nutritionist (RDN) in a grocery chain model

Sample size/Power analysis:
Estimating that 55% of patients below goal at baseline with a goal to increase by 20%, 50 subjects were needed

Secondary outcome measures:
- Patient awareness of medication risk to lower bone mineral density (prednisone, leuprorelin acetate, elagolix, etc.)
- Identification and resolution of potential medication related problems related to calcium supplementation.
- Coupon tracking for dietary supplement and food purchases

SETTING & PATIENTS

Setting
- The specialty pharmacy operates as a centralized processing specialty medications for a supermarket pharmacy chain with 77 community pharmacy locations

Targeted Patients
- Age between 18 -90 years old
- Receiving either osteoporosis therapy (denosumab, teriparatide, zoledronic acid, abaloparatide) or medications that increase bone loss (leuprorelin acetate, elagolix, oral prednisone equivalent > 5mg/day for 3 months)

REFERENCES

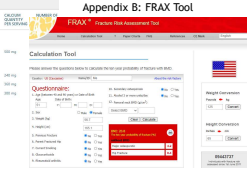
1. RDA National Institutes of Health Office of Dietary Supplements https://ods.od.nih.gov/factsheets/Calcium-HealthProfessional/
2. J Nutr 2011 Oct;141(10):1847-54. doi: 10.3945/jn.111.142257. Epub 2011 Aug 24.]
3. https://www.aace.com/sites/default/files/2020-05/Vol%2026%20Supplement%201%20%28May%202020%29%20GL-2019-0524_0.pdf
4. https://www.iofbonehealth.org/calcium-calculator]
5. https://www.sheffield.ac.uk/FRAX/tool.aspx?country=9
6. https://www.osteoporosis.foundation/educational-hub/topic/calcium-calculator

PATIENT ASSESSMENT AND EDUCATIONAL INTERVENTION

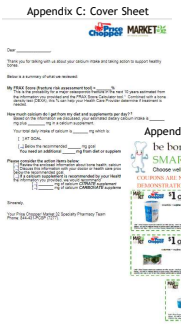
PATIENT ASSESSMENT	• Telephonic patient interview was conducted to gather information needed for assessment.
Estimated Calcium Intake	• Combined patients estimated milligrams (mg) of dietary calcium intake with calcium supplement use. • A validated tool was used to estimate daily dietary intake.[4] (A)
Medication History	• Collected dietary supplement use and noted medications with potential calcium associated medication related problems: proton pump inhibitors (PPI), histamine 2 receptor antagonists (H2RAs) or levothyroxine.
FRAX Assessment	• FRAX Fracture Risk Assessment Tool (B) was used (without DEXA scores) to calculate the 10-year probability of a major osteoporotic fracture or hip fracture in patients age >40.[5]
EDUCATIONAL INTERVENTION	• A specialty pharmacist and dietitian team collected and/or developed educational tools mailed to patients including a cover letter (C) with progress towards goal, FRAX assessment and recommendations.
Goal Calcium Intake	• National Osteoporosis Foundation NOF tools (used with permission) defined goal RDA intake (based on age and gender) with calcium/vitamin D fact sheets (D). [1,6]
Calcium Sources	• NOF materials identified calcium rich foods (E). • Coupons were provided to reinforce calcium rich food selection (F). • Type of supplement product (citrate vs carbonate) to select if needed.
FOLLOW-UP ASSESSMENT	• Telephonic follow-up occurred at 3-6 months to determine changes patient made following intervention and if goal calcium intake was reached.

Appendix A: Dietary Calcium Intake Tool

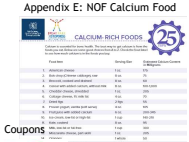
Appendix B: FRAX Tool



Appendix C: Cover Sheet

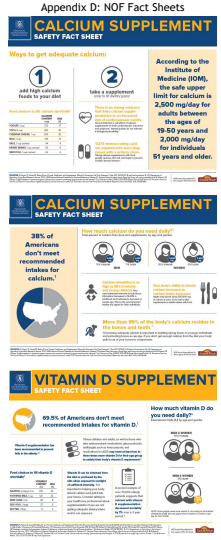


Appendix E: NOF Calcium Food



Appendix F: Coupons

Appendix D: NOF Fact Sheets

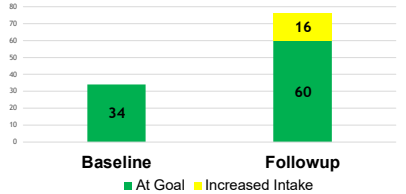


RESULTS

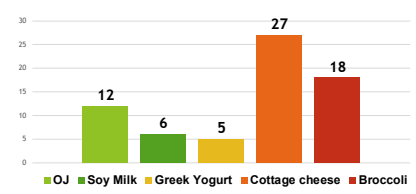
PATIENT DEMOGRAPHICS (n=50)		
Age, years (mean ± SD)		66.6 ±15.3
Gender, Female n (%)		47 (94%)
Medication	denosumab	36 (72)
	teriparatide	1 (2)
	zoledronic acid	1 (2)
	elagolix	7 (14)
	prednisone	5 (10)
Smoking status, Current		5 (10)
FRAX score, 10-year probability major osteoporotic fracture (mean ± SD)		18.5 ±11.5
FRAX score, 10-year probability hip fracture (mean ± SD)		6.6 ± 7.9
PPI or H2RA use, n (%)		25 (50)
Levothyroxine use, n (%)		7 (14)

DAILY CALCIUM INTAKE: DIETARY & SUPPLEMENTS	
Reports "Yes" to prescriber talked about calcium & vitamin D, n (%)	19 (38%)
Daily calcium dietary intake, milligrams (mean ± SD)	500 ± 247
Daily calcium dietary intake ≤ 200 mg, n (%)	5 (10)
Reports "Yes" to daily calcium supplement use, n (%)	22 (44)
Daily calcium supplement, mg (mean ± SD)	686 ± 284

Percent of patients At GOAL Calcium Intake



Coupon Redemptions (n)



RESULTS
- 17 patients (34%) at goal calcium intake at baseline, none with diet alone
- At follow-up, an additional 13 (26%) achieved goal intake
- Although 8 patients (16%) did not reach goal intake at follow-up, they increased either diet or supplement use toward goal indicating positive change
- While 4 patients made no changes, 1 patient taking prednisone chronically had no baseline assessment of osteoporosis, had a DEXA scheduled at follow-up

POTENTIAL MEDICATION RELATED PROBLEMS (MRP) IDENTIFIED
- All 7 patients taking levothyroxine with calcium supplementation (either at baseline or follow-up) were separating them by at least 1 hour avoiding potential MRP
- Of 6 patients taking calcium carbonate with PPI/H2RAs at baseline, 3 changed to calcium citrate at follow-up
- 3 patients misread calcium supplement labels: 3 tablets = serving size (not one tablet).
- Elderly patient "doesn't like to eat" with poor dietary intake, referred to prescriber

DISCUSSION AND LESSONS LEARNED

Progress Toward Goal Calcium Intake in Specialty Pharmacy Patients
- Average daily calcium intake at baseline was similar to previously published literature
- 26% of patients moved to goal and another 16% moved closer to goal warranting continued intervention
- While a combination of patient recall of dietary intake with interviewer estimation can be flawed, the data are consistent with national average of 500mg of dietary intake
- Even with potential concerns in data collection methodology, 10% of at-risk patients consuming less than 200mg/day is disconcerting

Prescriber conversations about osteoporosis risk and prevention
- Only 38 % of patients reported prescribers reviewed calcium and vitamin D intake, yet all targeted patients were on medications indicated for osteoporosis (recommended to be used with adequate calcium and vitamin D) or medications demonstrating risk of bone loss
- Although only a small number of included patients were prescribed medications demonstrated to significantly reduce bone density, their responses warrant further study. When 7 patients prescribed elagolix were asked if the prescriber reviewed that the medication can cause bone loss, 3 stated No and 4 were unsure. For 5 patients prescribed chronic prednisone, 2 stated Yes, 1 No and 2 were unsure

Patient Educational & Nutritional Needs
- Redemption of coupons by 54% of patients indicate their desire for nutritional methods to reach RDA goal warranting expanded collaboration of specialty pharmacy with nutrition services
- Our nutritional food guidance program for shoppers, "Know Your Colors", which pairs shelf tag colors with food specific nutrition attributes, lacks a calcium focused option identifying an opportunity for additional patient support
- The 10% of patients who defined themselves as current smokers were offered verbal smoking cessation counseling. This highlighted an opportunity to have more robust smoking cessation educational resources available to further support patient wellness