Own the Bone (OTB)
Barriers and Resources to Optimize Bone Health in Orthopaedic Education

Strategies to Incorporate Secondary Fracture Prevention in Residency Training

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Dr. Brent Ponce is a committee member of the American Orthopaedic Association Council of Orthopaedic Residency Directors (AOA/CORD) Academics committee.

Dr. Afshin Razi is a committee member of the AOA/CORD Own the Bone (OTB) program.

Dr. Stephen Kates is the Chair of the AOA/CORD OTB program.

Dr. Joshua Patt is the Chair of AOA/CORD Academics committee.

Objective

- Explore the results of the Orthopaedic Residency Bone Health Education Survey.

What are the perceptions of orthopedic resident education on bone health among program directors?

AMERICAN
ORTHOPAEDIC
ASSOCIATION

Study Team	Affiliations
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Overview

- Background and significance
- Design
  - Timeframe
- Subjects
  - Criteria
  - Sampling
- Variables
  - Predictor, confounder, outcome
- Statistical issues
  - Hypothesis, sample size, analytic approach

Background and significance

- The American Orthopaedic Association (AOA) created the Own the Bone (OTB) program in 2009
- OTB has aimed to improve comprehensive post-fracture care and education since its inception
- As a representative of AOA/CORD, the question presented itself as to whether more standardized education at the foundational level of Orthopaedic Residency is warranted and could have a positive long-term impact on post-fracture osteoporosis care for our patients

Use of the National Surgical Quality Improvement Program in Orthopaedic Surgery

Cesar S. Molina MD, Rachel V. Thakore BS, Alexandra Blumer BS, William T. Obremskey MD, MPH, MMHC, Manish K. Sethi MD

Clin Orthop Relat Res (2015) 473:1574–1581
DOI 10.1007/s11999-014-3597-7

- 1 TKA
- 2 THA
- 8 Open FNF
- 9 IT Nail
- 14 Hemi
- 16 Rev TKA
- 17 Rev THA
- 18 IT ORIF

Table 3. Top 10 procedures with highest number of adverse events and adverse event rates

Rank	Procedure	CPT® code	Number of adverse events
1	Open treatment of femoral neck fracture, internal fixation or prosthetic replacement	27236	767 (27.41%)
2	Hemiarthroplasty, hip, partial (eg, femoral stem prosthesis, bipolar arthroplasty)	27125	477 (26.18%)
3	ORIF intertrochanteric femur fracture with intramedullary implant	27245	695 (26.06%)
4	ORIF intertrochanteric femur fracture with plate and screw	27244	354 (24.07%)
5	Percutaneous skeletal fixation of femoral fracture, proximal end, neck	27235	140 (15.87%)
6	Revision of THA	27134	191 (12.74%)
7	Revision of TKA, with or without allograft, 1 component	27486	103 (12.17%)
8	Lumbar arthrodesis	22612	208 (10.91%)
9	Revision of TKA, both femoral and tibial components	27487	134 (8.18%)
10	Laminectomy, single vertebral segment; lumbar	63047	155 (7.15%)
	Total		3224/6742 (47.8%)

Perceptions of the Recommended Resident Experience with Common Orthopaedic Procedures

A Survey of Program Directors and Early Practice Surgeons

Alan K. Stotts, MD, Jessica M. Kohring, MD, Angela P. Presson, PhD, Morgan M. Millar, PhD, MA, John J. Harrast, MS, Ann E. Van Heest, MD, Chong Zhang, MS, and Charles L. Saltzman, MD

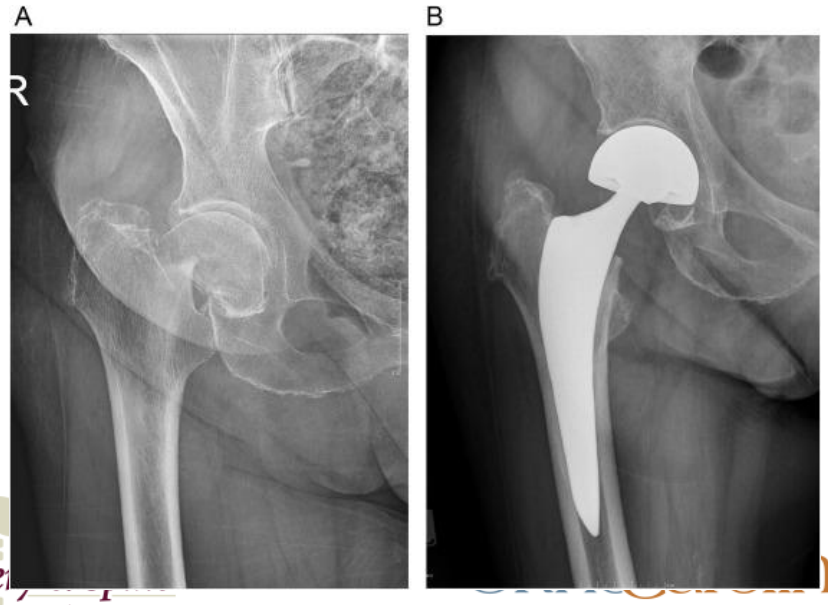
J Bone Joint Surg Am. 2019;101:e63(1-11)

- Training experience – Femoral neck fractures
- Early practice surgeons felt they needed 2x number of procedures to establish competency

ACGME Category (No. of Cases Recommended)	Procedures	ACGME Performed†	Directors (Median No. of Cases)	Examinees (Median No. of Cases)	Average (Median No. of Cases)
Hip fractures (30)	Femoral neck fracture ORIF or hemiarthroplasty	14.4	20	30	25
	Treatment of inter/per/ subtrochanteric femoral fracture with intramedullary nail	21.2	20	30	25

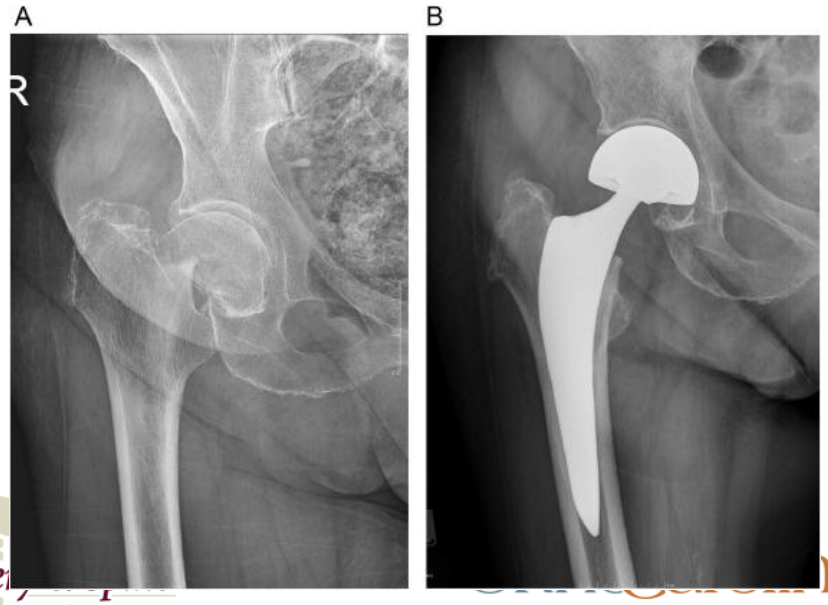
How do we bridge gap?

- Orthopaedic manifestations /consequences of poor bone health
- ABOS: Knowledge, Skills, Behaviors
- Essential component of orthopaedic training
- Knowledge component:



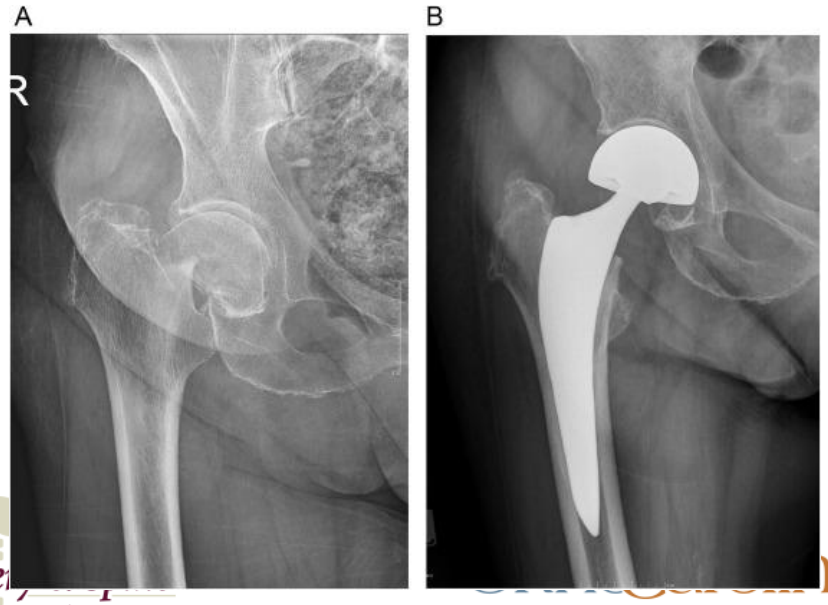
How do we bridge gap?

- Orthopaedic manifestations /consequences of poor bone health
- ABOS: Knowledge, Skills, Behaviors
- Essential component of orthopaedic training
- Knowledge component:
  - Biomechanics
  - Bone biology
  - Patient optimization
  - Prevention



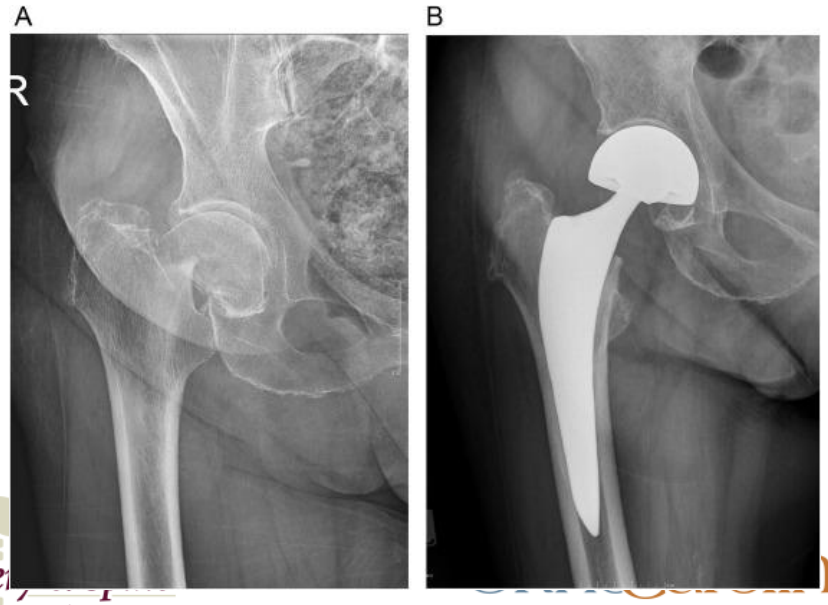
How do we bridge gap?

- Orthopaedic manifestations /consequences of poor bone health
- ABOS: Knowledge, Skills, Behaviors
- Essential component of orthopaedic training
- Clinical component:



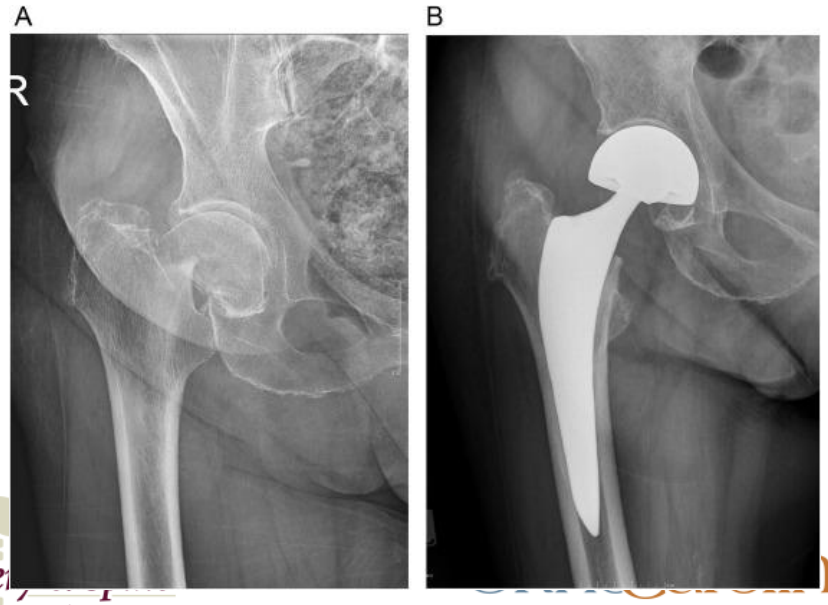
How do we bridge gap?

- Orthopaedic manifestations /consequences of poor bone health
- ABOS: Knowledge, Skills, Behaviors
- Essential component of orthopaedic training
- Clinical component:
  - Simulation training
  - Operative experience



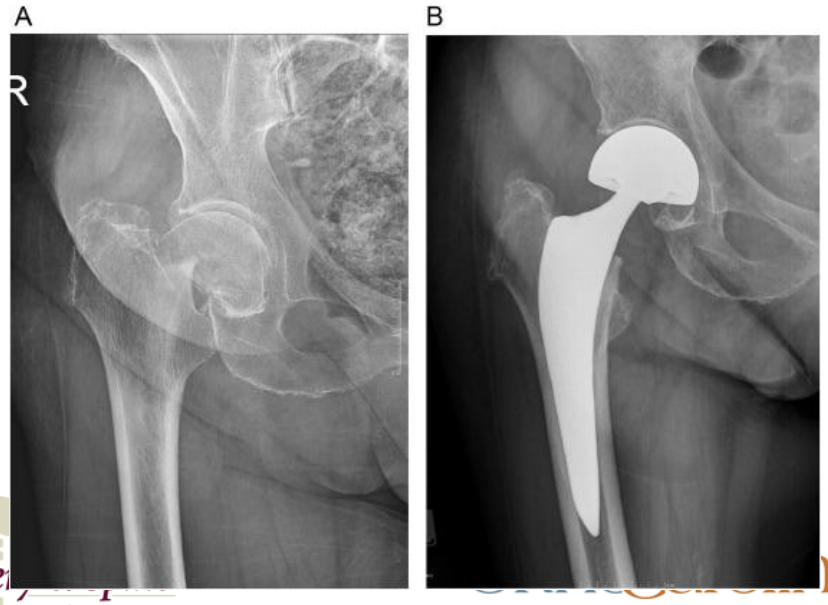
How do we bridge gap?

- Orthopaedic manifestations /consequences of poor bone health
- ABOS: Knowledge, Skills, Behaviors
- Essential component of orthopaedic training
- Behavioral component:



How do we bridge gap?

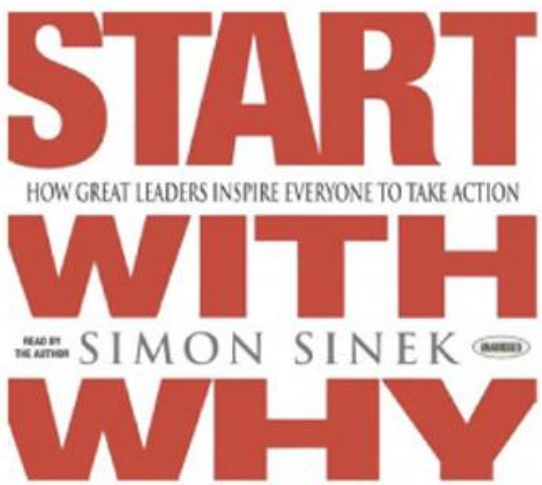
- Orthopaedic manifestations /consequences of poor bone health
- ABOS: Knowledge, Skills, Behaviors
- Essential component of orthopaedic training
- Behavioral component:
  - Professionalism
  - Role in society

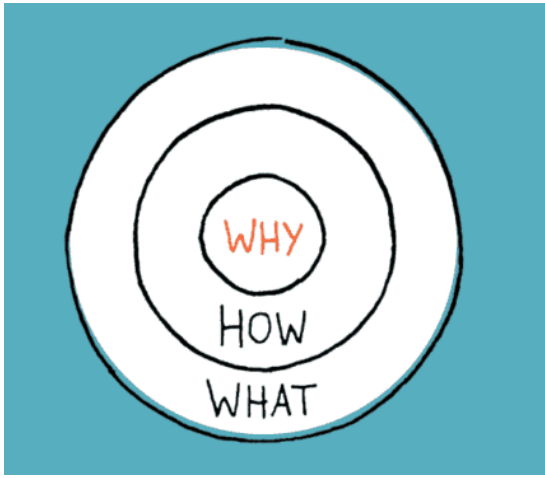


Objective

- Investigate the current state of bone health education in orthopaedic residency training
- Identify areas of potential improvement in orthopaedic graduate medical education through a survey of Orthopaedic Program Directors
- Hypothesis: Interest and resources would be highest at OTB member institutions

Start with Why





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Why do residents need this?

- Orthobullets has an 8 year running list of the most tested topics on the OITE
- Bone biology questions
  - 47 osteopenia/osteoporosis
  - 25 bisphosphonates
- Clinical questions
  - 54 femoral neck fx
  - 53 THA periprosthetic fx
  - 26 IT fx

- If you combine those questions:
- Bone biology - #6
- Clinical - #1

Research Questions

What are the perceptions of a bone health rotation or fracture liaison service among orthopaedic program directors / associate program directors?

What are the opinions of the residents?

Four sections:

- Characteristics of programs
- Current resident training
- Barriers
- Resources

Methods

- An invitation to participate in an anonymous, electronic survey was distributed by the American Orthopaedic Association Council of Orthopaedic Residency Directors Own the Bone (AOA/CORD/OTB) program and the Collaborative Orthopaedic Educational Research Group (COERG) to Program Directors of Orthopaedic Surgery Programs in the United States
- Analyses were performed using JMP® Pro 14 statistical software (SAS Institute Inc., Cary, NC). T test with assumed unequal variances, Chi-square, or Wilcoxon Mann Whitney test were used

Results

Total responses: 60 Program Directors completed the survey (complete >80%)

Dates: information collected between August to October 2020.

PDs 60/129 = 47% Residents 66/? = ?

		Fracture Liaison Service	
	No formal system	**Non-OTB Fracture Liaison Service**	**OTB**
PD	42% (n = 25)	30% (n = 18)	28% (n = 17)
Resident	32% (n = 21)	35% (n = 23)	33% (n = 22)

Characteristic	No formal system No. (%)	Non-OTB Fracture Liaison Service No. (%)	OTB No. (%)	P Value
Program Directors (n=60)				
Program location				0.46
Northeast	24	22	29	
Midwest	24	28	29	
West	20	0	6	
Southeast	16	33	24	
Southwest	16	17	12	
Number of clinical/teaching faculty in program, mean	22	31	33	0.17
Number of residents in program, mean	20	25	24	0.37
Current resident training				
Syllabus for bone health education*				0.03
No	72	33	47	
Yes	28	67	53	
Clinic days that residents attend the bone health clinic or perform bone health assessments in fracture patients				0.97
1-3 days	66	74	62	
4-21 days	17	13	15	
>28 days	17	13	23	
Lectures on osteoporosis, secondary fracture prevention, and interpretation of diagnostic imaging per year, mean	3	3	4	0.51

	No formal system (%)	Non-OTB Fracture Liaison Service (%)	OTB (%)	P Value
Current resident training				
Do residents attend a specific bone health clinic or assess bone health in fracture patients?				
Yes, both bone health clinic and assessment of bone health in fracture patients	0	12	18	
Yes, attend bone health clinic only	0	0	0	
Yes, assess bone health in fracture patients only	24	44	59	
No, neither bone health clinic nor assessment of bone health in fracture patients	64	44	23	
Don't know	12	0	0	
The bone health clinic or fracture asssessment is done by:				0.15
A fracture liaison service coordinator (NP/PA)	0	50	46	
An orthopaedic surgeon	50	30	23	
Another medical specialist, such as an endocrinologist, rheumatologist, or gerontologist	33	20	31	
No response	17	0	0	
Bone health rotation in orthopaedic surgery program				
Would a bone health rotation be useful?				0.13
No	68	39	47	
Yes	32	61	53	
Would you welcome a bone health rotation?				0.20
No	68	50	41	
Yes	32	50	59	

Characteristic	No FLS (%)	FLS (%)	P Value
Program Directors (n=60)	42	58	
Program location			0.23
Northeast	24	26	
Midwest	24	29	
West	5	3	
Southeast	16	29	
Southwest	4	14	
Number of clinical/teaching faculty in program, mean*	22	32	0.04
Number of residents in program, mean	20	24	0.14
Current resident training			
Syllabus for bone health education*			0.01
No	72	40	
Yes	28	60	
Clinic days that residents attend the bone health clinic or perform bone health assessments in fracture patients			0.98
1-3 days	67	67	
4-21 days	17	14	
>28 days	17	19	
Lectures on osteoporosis, secondary fracture prevention, and interpretation of diagnostic imaging per year, mean	3	3	0.30
Bone health rotation in orthopaedic surgery program			
Would a bone health rotation be useful?			0.05
No	68	43	
Yes	32	57	
Would you welcome a bone health rotation?			0.08
No	68	45	
Yes	32	54	

FLS, Fracture liaison service

Perceptions of potential barriers to osteoporosis care among Program Directors grouped by no FLS vs with FLS.

Characteristic	No FLS (mean)	FLS (mean)	Mean difference	P Value
Lack of time within a busy clinical program for a non-operative care rotation	7	7	0	0.39
Absence of institutional leadership on this issue	7	4	3*	<0.001
Lack of consultants and experts to provide osteoporosis care and hands-on education	7	5	2*	0.01
Poor reimbursement for osteoporosis care	7	5	2*	0.01
Poor motivation of faculty to teach and learn about osteoporosis care	6	6	0	0.07
Poor motivation of residents to learn about osteoporosis care	5	5	0	0.31
Perception that osteoporosis is not within orthopaedic sphere of care	5	3	2	0.09
Inadequate availability of DXA testing	2	3	-1	0.35
Not an important topic due to minimal testing on OITE and ABOS	3	3	0	0.94

Educational programming wants

Educational programming	Median
Resident-focused webinar series on osteoporosis	7
Review of several best practices regarding osteoporosis care and education	7
5-year AOA/CORD/OTB osteoporosis curriculum	6.5
Journal list or bibliography of articles	6
Recorded video case studies on osteoporosis management	5

Conclusions

- This study demonstrates a deficit in osteoporosis education that is most pronounced in programs without any formal FLS (including OTB)
- Program directors desire better resources for education
- There does not seem to be interest in formal bone health rotations
- Bone health related procedures will be commonly performed by our trainees once in practice
- Bone health related knowledge is highly emphasized on the orthopaedic in-training and Step 1 board exams

Conclusions

- Many of our residents will need to know how to help advise and lead a FLS in the future
    - Most important for general ortho and hip and knee reconstruction surgeons
- Systems based answers and education are desired that will supplement current education
- Own The Bone can support programs by creating content available to programs (on-demand programming)
- Programs can better prepare their residents by enrolling in OTB or developing a formal FLS

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Thank you!