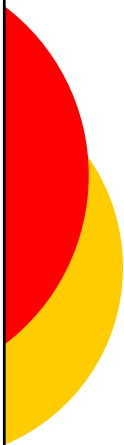


Cette présentation a été effectuée le 11 mars 2010, au cours de la journée « Santé osseuse : pour vieillir sans fracture » dans le cadre des Journées annuelles de santé publique (JASP) 2010. L'ensemble des présentations est disponible sur le site Web des JASP, à l'adresse <http://www.inspq.qc.ca/archives/>.



Cost-saving programs that prevent hip fractures:

The coordinator model for post fragility fracture osteoporosis intervention

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University of Toronto



Disclosures

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- Grant/Research Support from Ministry of Health of Province of Ontario
- Consultant for: Procter & Gamble Pharmaceuticals Canada Inc.
- Speaker at events sponsored by: Merck Frosst Canada Ltd., Procter & Gamble Pharmaceuticals Canada Inc.



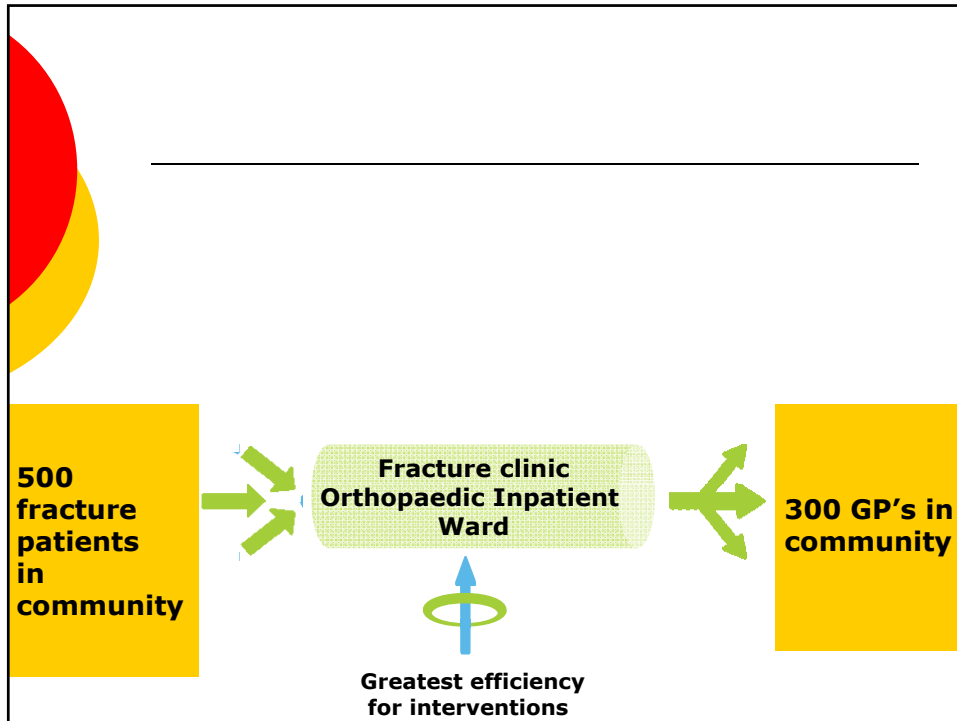
Objectives: to review...

- how the **fracture clinic** is an ideal location to initiate osteoporosis (OP) care in fragility fracture patients to prevent future hip fractures
- To discuss **program development** to support OP investigation and Rx for fragility fracture patients



Goal: to prevent hip fractures

- Method: to **identify and treat high risk patients in fracture clinics**, when they present with various fragility fractures



OP Rx: for the patient at Highest Risk for hip fracture

- Orthopaedic surgeons daily treat patients who have fragility fractures
- Our **challenge is NOT case finding**.....(the cases find us!)

→ #1 challenge is to ensure appropriate Dx and Rx for OP occurs

Typical Fragility Fractures

- Men \geq 50; Women \geq 40
- # from a fall from standing height
- Typical Sites:
 - Vertebrae
 - Wrist
 - Shoulder
 - Hip



-
- Clavicle
 - Elbow
 - Scapula
 - Rib
 - Ankle
 - Distal femur
 - Tibia

***Most fracture sites
are potential fragility
fractures***

***Exclude face and skull, fingers
and toes***



Prevalence Estimates for OP in Canada

	<i>data from CaMos study</i>	
<i>Gender</i>	Osteopenia	Osteoporosis
<i>Female</i>	45.9%	7.9%
<i>Male</i>	39.1%	4.8%

Tenenhouse et al., 2000



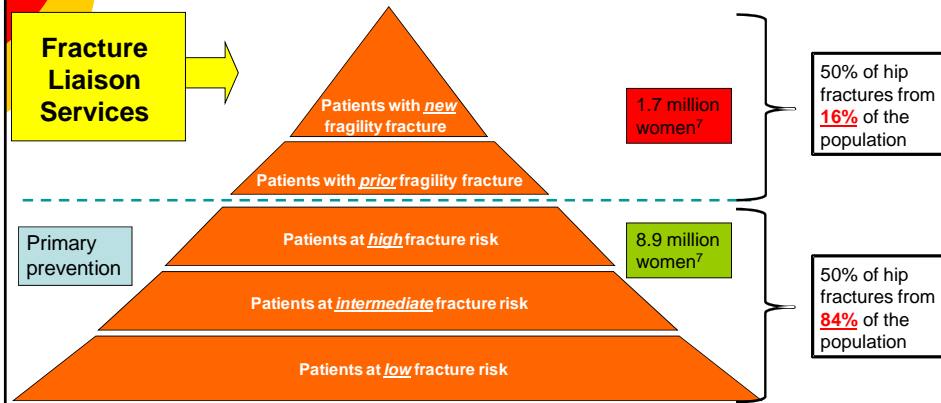
Assessing Fracture Risk: **Prevalent Fracture** is an important factor

- Canadian Guidelines for 10-year fracture risk:
 - Age
 - Sex
 - BMD (lowest t-score)
 - **fragility fracture history**

Previous approach: base risk on bone density (DXA) alone

United Kingdom: Fracture risk and ease of case-finding Effective targeting of healthcare resources

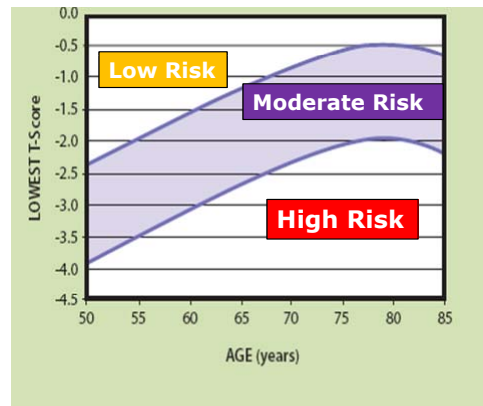
The majority of post-menopausal women (84%⁷) have not suffered a fragility fracture
Strategies to case-find new and prior fracture patients could identify up to
50% of all potential hip fracture cases from 16% of the population




7. BOA-BGS 2007 Blue Book, <http://www.nhfd.co.uk/>

15. (Adapted from) *Curr Med Res Opin* 2005;21:4:475-482 Brankin E et al

10 Year Fracture Risk for Women

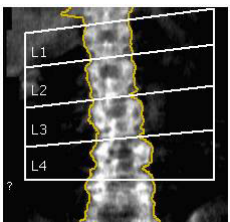
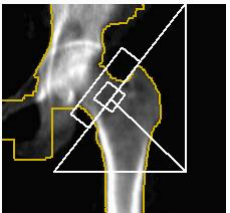


Osteoporosis Canada: Siminoski et al



Case Example

57-year-old Female with a Low Trauma Fracture

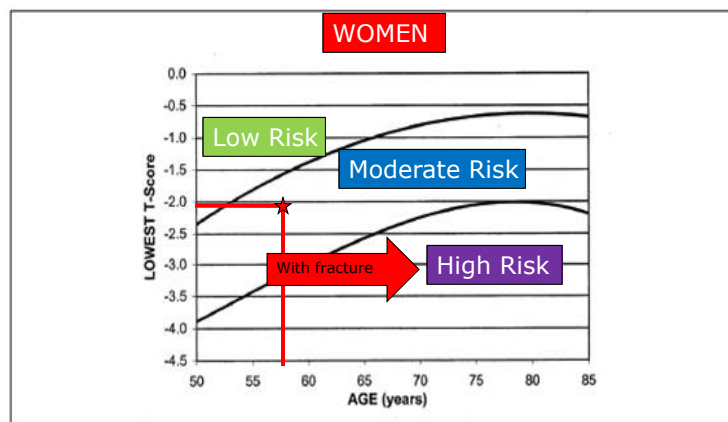
Region	BMD (g/cm ²) ¹	Young-Adult (%) ²	T-Score	Age-Matched (%) ³	Z-Score
L1	0.871	77	-2.2	86	-1.2
L2	0.887	74	-2.6	82	-1.7
L3	0.961	80	-2.0	89	-1.0
L4	0.970	81	-1.9	89	-1.0
L1-L2	0.879	75	-2.4	84	-1.4
L1-L3	0.910	78	-2.2	86	-1.2
L1-L4	0.928	79	-2.1	87	-1.1
L2-L3	0.926	77	-2.3	85	-1.3
L2-L4	0.943	79	-2.1	87	-1.2
L3-L4	0.966	81	-1.9	89	-1.0
Date	(years)	(g/cm ²)	(%)	(%/yr)	
10-Mar-2009	57.0	0.928	baseline	baseline	?

Region	BMD (g/cm ²) ¹	Young-Adult (%) ²	T-Score	Age-Matched (%) ³	Z-Score
Neck	0.735	75	-2.0	85	-1.1
Wards	0.564	62	-2.7	77	-1.3
Troch	0.648	82	-1.3	87	-0.9
Shaft	1.019	-	-	-	-
Total	0.846	85	-1.3	93	-0.6

BMD results

- L1-L4 T-score of -2.1
- Left femoral neck T-score of -2.0
- Interpretation: **osteopenia at both measurement sites.**
- **By age, sex and BMD, her risk is “moderate”**

10 Year Fracture Risk: Prevalent fracture increases risk by 1 grade





Treatment

- Calcium 500 mg po bid
- 1000 IU Vitamin D3 po od
- Risedronate or alendronate (or other approved agent)
- Don't forget....
 - Education
 - Follow up
 - Falls prevention



Fracture Risk Reduction with Rx

- **Risedronate: Fracture Reduction:** 27% ↓ in the relative risk (RR) of non-vertebral fractures (RR = 0.73) after Rx
Cranney et al, 2002
- **Alendronate: Fracture Reduction:** 49% ↓ in the RR of non-vertebral fractures (in patients given ≥10 mg) (RR = 0.51)
Cranney et al, 2002
- **Zoledronic Acid:** 35% fracture risk ↓ with zoledronic acid (P=0.001); 28% ↓ in deaths from any cause in the zoledronic acid group (P=0.01)
Black et al, 2007



Models of Post-Fracture Bone Health Care



Poor Record of OP Care Post Fracture around the world

- Simple intervention in 5 Ontario community hospitals
 - reminders to Pts, FDs, Orthopedists
 - 6 week follow-up mailing
 - 64% follow-up with MD
 - 69% of those had densitometry

however.....

ONLY 24% (vs 17% of historical controls, NS) received Ca, Vit D, HRT, BP

Hawker et al, OI, 2003



Literature Review of OP Care Post Fracture

- 29 studies reported on OP investigation, diagnosis and/or treatment after fracture
- Less than 32% of frag # pts investigated by DXA
- In those pts who had DXA, only 1 - 38% received Rx

Elliot-Gibson et al, OI, 2004

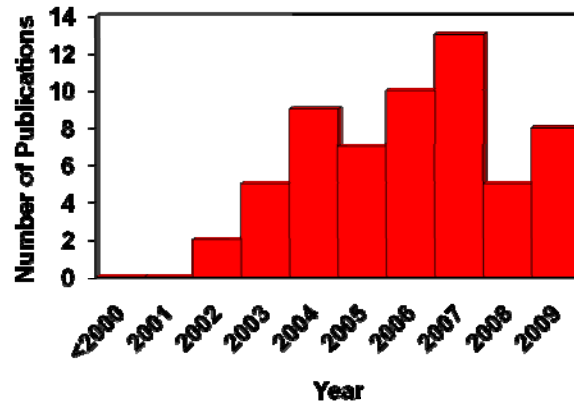


Fragility Fractures and the OP Care Gap con't...

- **Review of 35 studies found:**
 - Fragility fracture pts not receiving OP Rx
 - OP Dx was considered in 1-45% of # pts
 - 1 - 32% of pts had DXA
 - Ca/Vit D and Rx in 2 - 62%
 - OP Rx more likely in women, elderly, vertebral fractures
 - 1-22% of patients had a subsequent fracture after 6 months to 5 years

Giangregorio et al, 2006

Publications on Orthopaedic Programs for Post-Fracture OP Management



Range of interventions

- Screening and education only
 - Cuddihy 2004
- Novel patient education programs
 - Gardner 2005
- Very intensive programs – coordinator, physician and pharmacist all part of program
 - Bogoch 2006
 - Majumdar 2007



Trends

- **Coordinator** present in most studies
 - Ortho surgeon + team need support
- BMD done within program in 20 studies
- Increasing focus on education of patient re: 10 year fracture risk



RCT's vs. Programs

- | | |
|---|---------------------------|
| ○ Inclusion criteria | ○ Cover a population |
| ○ Termination date | ○ Ongoing |
| ○ Specific endpoints | ○ Interventions evolve |
| ○ Identify effect of interventions in a defined group | ○ Lower level of evidence |
| ○ Limited generalizability | ○ Needs ongoing funds |



Mailouts to GP: reminder to Test and Treat for OP

- Cluster RCT: 270 women in ER, wrist fracture, cared for by 119 GPs
 - Intervention:
 - mailed letter and OP guidelines to GP
 - educational package and letter to the women
- ↑ BMD testing (53.3% vs. 26%) $p < 0.001$
- Intervention: ↑ use of OP Rx (28% vs. 10%) $p = 0.002$

Cranney, 2008



Advising physicians works poorly: Rural Ontario

- Educational intervention in 5 rural communities
- 4,207 educational packages distributed; 73% of MD's had an outreach visit
- Results: No sig. improvement in post-fracture OP care (BMD 32% in "pre" group vs. 25% in "post" group)

Jaglal, 2008

ROCKET (coordinator model for low volume rural)

- Methods: Cluster RCT
- Pts over 40 with low trauma fractures identified in hospital ER
- Coordinators followed up with fracture patients and with MDs
- Education, recommendation, follow-up reminders and phone calls

Jaglal 2009

29

Results of rural coordinator model

OUTCOME (6 months)	Intervention n = 131	Control n = 138	p-value
MD visit after fracture	82%	55%	<0.001
BMD scheduled/performed	57%	21%	<0.001
Self-report if have OP or not	80%	62%	0.002
Appropriate Treatment -OP diagnosis + on meds -Normal BMD + prevention advice	43%	27%	0.006



When Coordinator Arranges Testing and Treatment....

- Target Group: Pts \geq 50 y.o., hip fracture
- 110 intervention, 110 control
- Pt counselled AND tests booked: BMD
- After BMD, case manager arranged Rx

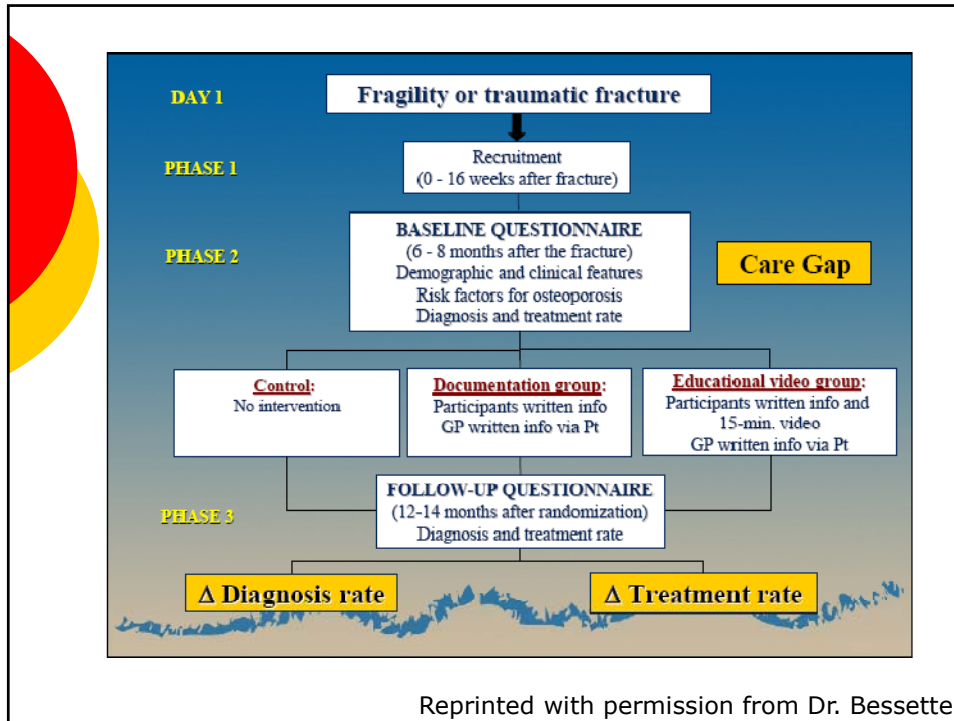
- **↑ BMD testing to 80% (vs. 29% in the control group) ($p < .001$)**
- **↑ OP Rx to 51% (vs. 22% for controls) within 6 months of fracture ($p < .001$)**

Majumdar, 2007



Use of Administrative Database

- Bessette, 2008
 - Recognizing Osteoporosis and its Consequences in Quebec (ROCQ)
 - Phase 1: Women with wrist fractures contacted
 - Phase 2. Randomized to : 1) Educational Video Group OR 2) Documentation Group OR 3) Control Group.
 - Phase 3: Evaluation of rates of Rx and Dx of OP
 - Patients followed 20 years for fractures through Québec Ministry of Health database



St. Michael's Hospital: Osteoporosis Exemplary Care Program (OECF)

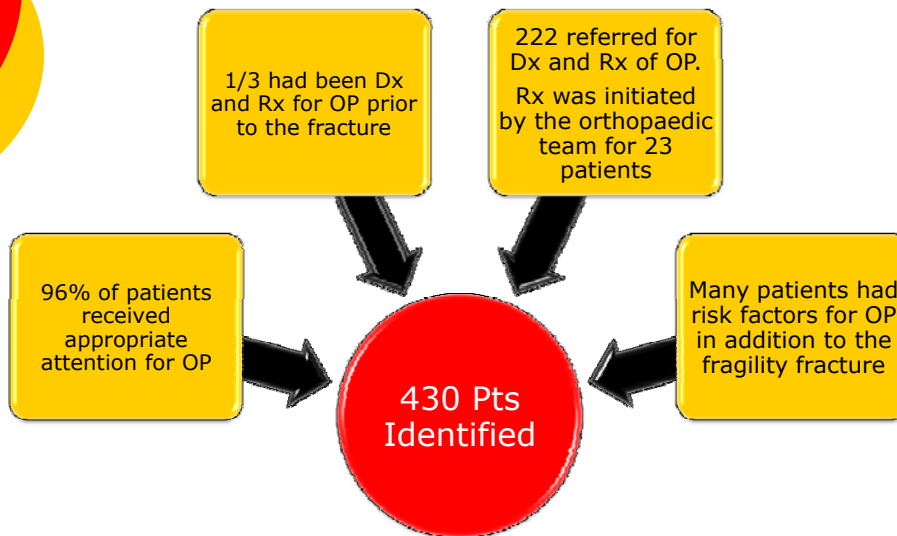
THE JOURNAL OF BONE & JOINT SURGERY
J B & J S

*This is an enhanced PDF from The Journal of Bone and Joint Surgery
 The PDF of the article you requested follows this cover page.*

Effective Initiation of Osteoporosis Diagnosis and Treatment for Patients with a Fragility Fracture in an Orthopaedic Environment

Earl R. Bogoch, Victoria Elliot-Gibson, Dorcas E. Beaton, Sophie A. Jamal, Robert G. Josse and Timothy M. Murray
J Bone Joint Surg Am. 88:25-34, 2006. doi:10.2106/JBJS.E.00198

Results of St Michael's coordinator



Change in Physician Behaviours

- Chart documentation of OP management
 - 27.5% of patients prior to program implementation
 - over 75% post implementation

Ward et al, OI, 2007



Economic analyses (Canadian)

- Cost effectiveness studies:
 - Intensive coordinator based models in Canadian system
 - Conservative estimates
- **Majumdar, 2009**
 - Costs of care (Coordinator ~ \$56 per patient) + OP treatment vs. hip fracture care (acute, rehab, long term)
 - Assumptions: 85% adherence x 5yrs
- **Sander, 2008**
 - Costs of inpatient care *not rehabilitation, not long term care
 - Adherence held constant in both groups at 59%
 - Very conservative estimates – ie, 48% identified without coordinator
- Sensitivity analyses robust
- Coordinator is cost-saving



Benefits of the Coordinator Program

- Δ in physician behaviours
- Cost saving (Sander 2008)
- \uparrow documentation by clinical team
- \uparrow identification of atypical patients
- \uparrow knowledge and attitudes in pts
- \uparrow appropriate referral for DXA and consultation with OP specialists

(Various publications St Michael's)

Kaiser Permanente Southern California Osteoporosis Program

- Orthopedic Surgeons Lead Champions on a Multidisciplinary Team comprehensive program to prevent fractures
- Care plans with OP Rx orders after a fragility fracture
- OP case management program
- Home health program for home safety check

Rick Dell, 2008

Kaiser: Reduction in Hip Fractures

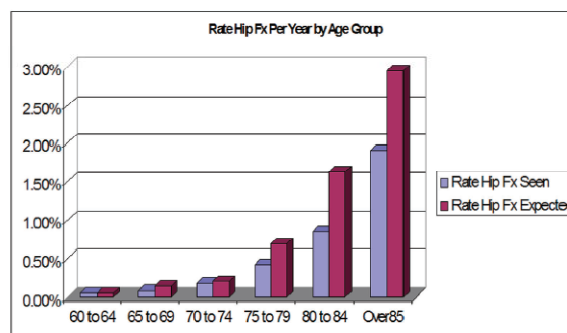
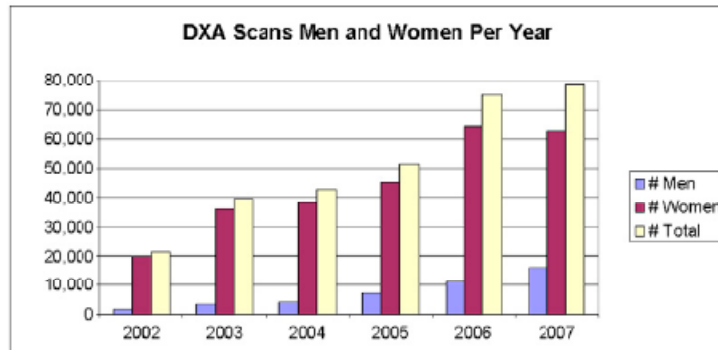


Fig. 3

In 2006, the expected number of hip fractures was 2510 fractures and the observed number was 1575, representing a reduction of 935 fractures.

Dell et al, 2008

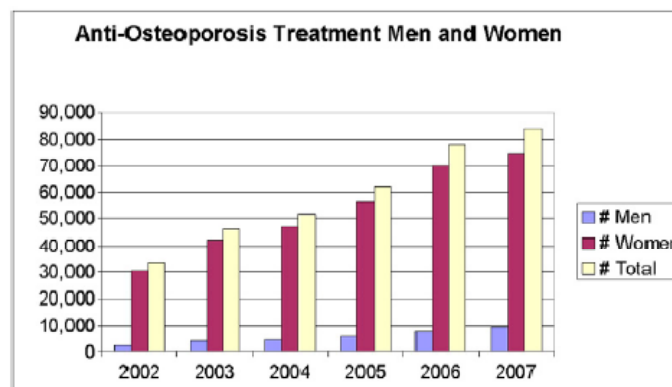
Kaiser: Increase in BMD testing



Bar graph illustrates an increase in the number of DXA scans of 213% in women and 914% in men between 2002 and 2007

Dell et al, 2009

Kaiser: Increase in Treatment Rx



Bar graph illustrates a 145% increase in women and a 250% increase in men in the use of anti-osteoporosis medications between 2002 and 2007

Dell et al, 2009



United Kingdom

- The Fracture Liaison Service (Glasgow) performs fracture case-finding
- DXA, diagnostics, makes Rx recommendations
- Follows up with FDs
- ***FLS is a coordinator type program***

(McLellan 2003)



Ontario Osteoporosis Strategy

- \$5 million per year in funding announced in February, 2005
- Ontario MOH consulted with:
 - Osteoporosis Society of Canada
 - Ontario Orthopaedic Association
 - Dairy Farmers of Canada
 - Existing provincial programs

Ontario Osteoporosis Strategy

Health Promotion
Goal #1

- Osteoporosis Canada
- Dairy Farmers of Canada

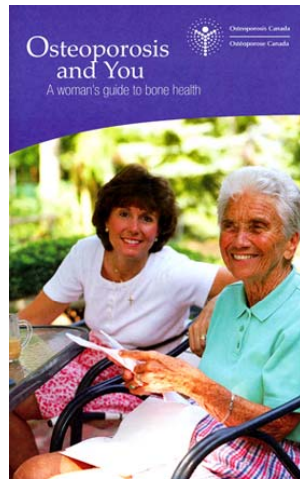
Post
Fracture
Care
Goal #3

- **Toronto Rehabilitation Institute**
- **McMaster University**
- *Osteoporosis Canada*
- *St. Michael's Hospital*
- *OOA – Steven Richie (consultant)*

Research &
Evaluation
Goal #5

- Osteoporosis Canada
- Women's College Hospital
- St. Michael's Hospital

Goal #1: Health Promotion for Seniors






Reached 33,000 Ontario grade 5 students (1250 classes)





Goal #2: Improve the appropriate use, and accuracy of BMD testing

- **Quality Assurance Standards for BMD Testing:**
- **New Recommended Use Requisition (RUR) for BMD Testing:**



Goal #4: Improve MD utilization of clinical practice guidelines

- CME courses for family physicians
- CME courses for other healthcare professionals
- Falls prevention model for CME
- Physician Tools
- Discipline-specific case studies for undergraduate and graduate clinical education

Goal #5: Research and Evaluation

- Management and System Integration Committees
- Planning Retreat, Stakeholder Forum, Web site
- ORMEW: committee for Monitoring and Evaluation, indicators, reports
- Research Network, and set research priorities

Goal #3: Post-Fracture Care and Intervention





Components

- **Province-wide fracture clinic intervention program**
- Fracture Clinic Coordinators and Area Managers
- Self-management programs
- Long-term care guidelines and algorithms



Fracture Clinic Program

- **Coordinator** based model
- Men and women \geq **50 years** of age
- **Low trauma fractures** of the wrist, elbow, shoulder, clavicle, hip and femur, tibia, fibula, ankle, and vertebrae
- Educate patients and refer back to FP for further investigation and Rx

19 coordinators in 36 fracture clinics



★ Coordinator in place

Supporting coordinators: virtual network www.OSCnet.ca

OSC
OSTEOPOROSIS
SCREENING COORDINATORS

Rebeka Sujic

- My blog
- Create content
- My quotes
- Switch to test user
- Web File Manager
- News aggregator
- Comments
- Content
- Forums
- News aggregator
- Post settings
- Search content
- Webforms
- Blocks
- URL aliases
- Access control

Home

What's New

- Consenting patients for research use of data - Rebeka Sujic
- Synch Issues - Kelly Ward
- Happy New Year! - Rebeka Sujic
- DATES OF FOLLOW UP - Rebeka Sujic
- software issue - Jo-Ann Bruce

Upcoming Events

Who's online

There are currently 1 user and 0 guests online.

Online users

- Rebeka Sujic

Daily Report Log Views

Here is the Manager's View of all logs.

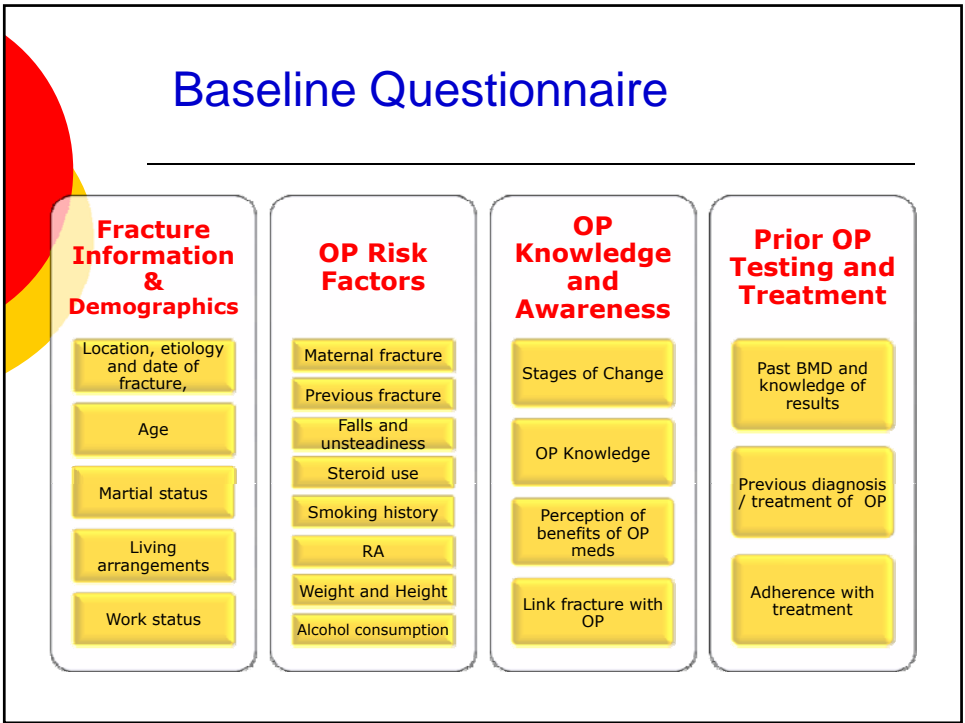
New - Sum Filtered View

There is a new query available to the admin and manager user-roles that will enable you calculate a sum of daily log totals, filtered by coordinator name, hospital name and date range.

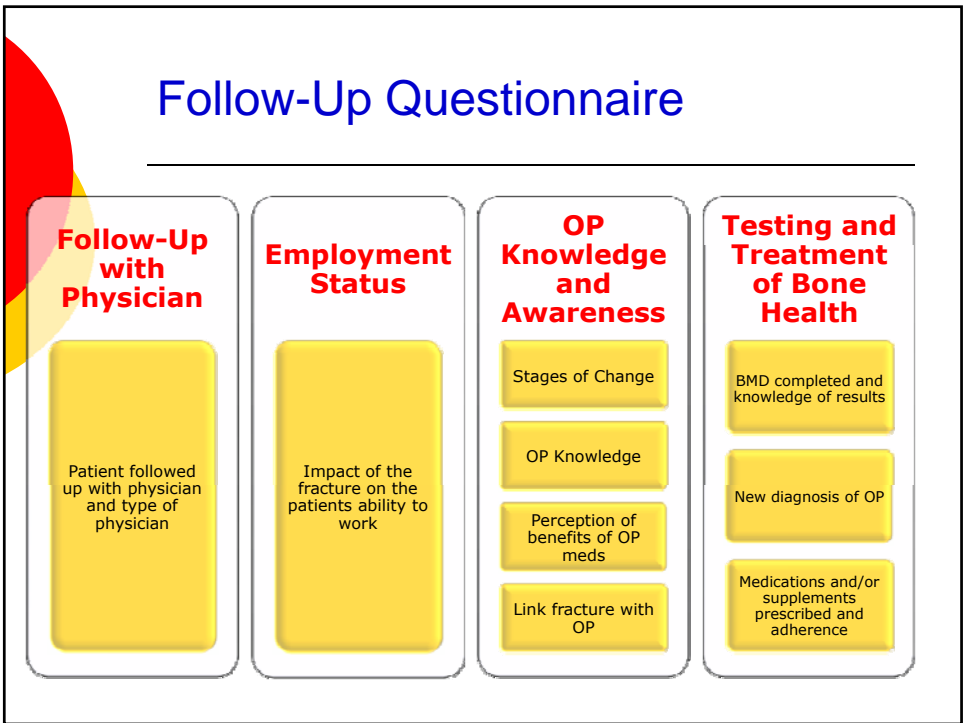
Questions?
Please contact Paul.

TrialStat!

Baseline Questionnaire



Follow-Up Questionnaire



Progress to Date



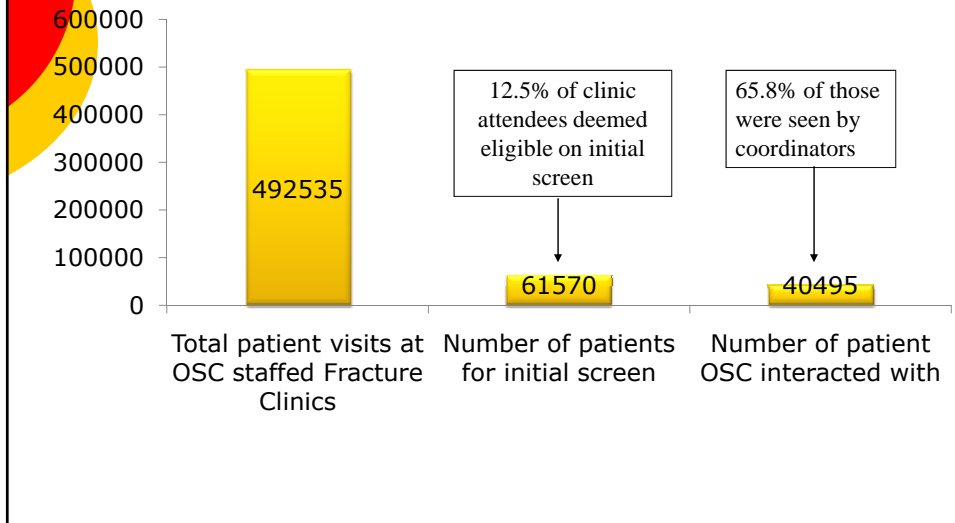
- Started January 6, 2007
- Screened > 490,000 visits as of Dec 31, 2009
- Data on computers, web-based secure database
- St Michaels Hosp is study centre for data analysis

'Ethics' and Privacy:a major barrier

- REB reviews at each hospital
- 36 sites with 29 ethics boards
- Ontario Privacy Commissioner

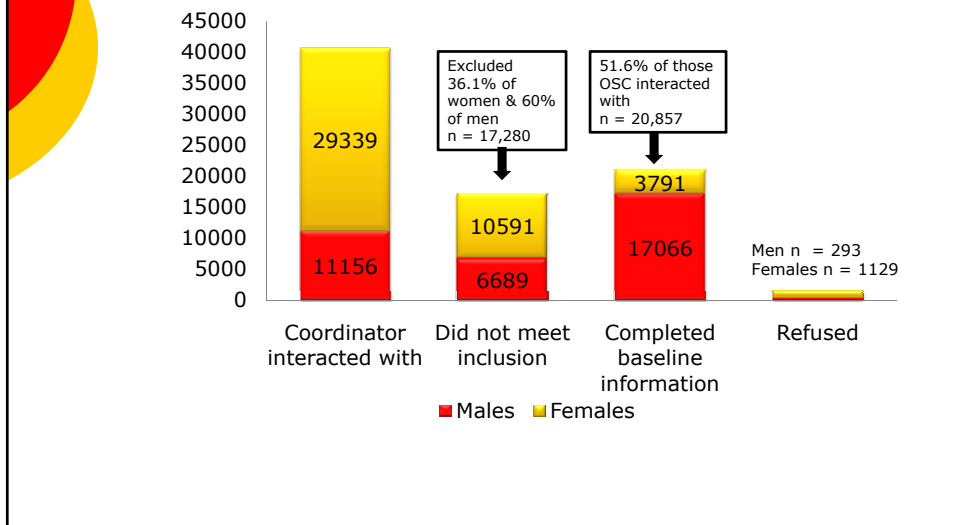
Daily log data analysis: Flow

(e-daily logs, May 2, 2007- December 31, 2009)

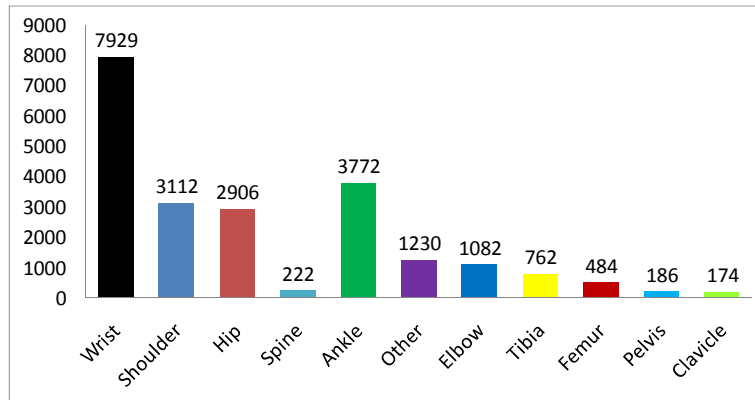


Volume

(May, 2007 – December 31, 2009)



Fracture Sites (n = 21,295)



Intervention subset (March/09)

Follow-Up

- 18,453 patients provided with OP educational materials

BMD

- 14,805 patients advised to have family physician order BMD

Family Physicians

- 12,722 family physicians received request for OP follow-up



Currently establishing: ICES link

Determine re-fracture rates and bisphosphonate Rx pre- and post-implementation of Ontario program



Challenges: Optimize intensity of Model

- Evidence that **PCP are unlikely to treat** a high proportion of patients based on recommendation letter
- Newer evidence that **DXA at source promotes Rx** by PCP
- **Providing 10-year risk profile** to MD + pt is motivating



Ideally....

- DXA at source
- Risk profile completed by coordinator
- **Specific** Rx for patient recommended
- Evidence sent to PCP
- Where OP is complex (eg males, secondary OP) --- specialist consultation



Next Steps for Ontario OP Strategy

- Currently *educational* and *advisory* to PCP
- ? impact and feasibility of **DXA at source**
- **Link to provincial databases** for medication use and later hip fracture
- ↑ involvement of orthopaedic surgeons
- Continue to research key issues



Equity Gap

- Manitoba
- New Brunswick
- The North

Ontario Osteoporosis Strategy
Evaluation of High Volume Fracture Clinic Screening



Lessons learned in Canada

- Highest density facilitation leads to best results
 - Morrish, 2009
- Coordinator models work in practice
 - In high volume clinics (Bogoch 2006; Beaton 2009)
 - Centralized in rural area (Jaglal ASBMR 2009)
 - Cost effectiveness analyses
- Traditional model: *expecting orthopaedic surgeon + family MD to treat* isn't working
- Mass education program: no benefit Jaglal 2009




Economic analyses Canadian data

- Both found cost favourable for the program
 - Sander 2006: coordinator program “dominant” when >350 patients seen per year
 - \$25,000 per hip fracture prevented
 - Majumdar 2005: coordinator program a dominant strategy
 - for every 100 hip fracture seen 6 hip fractures were prevented.
 - Savings of \$260,000




Summary

- Highest yield for hip fracture prevention is in treating the high risk patient
- Highest risk patients found in fracture clinics
- Fracture clinic a fruitful site for prevention programs



- The fracture patients are found in the fracture clinic!
- Fracture patients have a high risk for future hip fracture
- The fracture clinic is the place to find and treat high risk patients to prevent hip fractures



Coordinators get the job done

- Coordinator programs work best for finding, educating and arranging for patient Dx and Rx
- Fracture prevention in high risk pts is effective, safe and inexpensive



Feasible and Economical

- Large scale coordinator programs (Kaiser Permanente, Glasgow, Ontario) have been successful
- Hip fracture prevention programs are cost-saving