


# Calcium intake and fracture risk in elderly women



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# The clinical scenario

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## The patient, problem & **key research data need**

- Mrs X is an elderly lady and broke her femur at when she had a fall on the way to the shops – she wants to know if **taking calcium supplements will reduce her chance of future fracture**

## The search (database & terms) & results

- PubMed Clinical Queries
- Search terms: (elderly OR old person OR pensioners OR geriatri\*) AND (woman OR women OR female OR lady) AND (fracture OR break OR bone)
- 2234 results for systematic reviews
- Chose *Calcium intake and risk of fracture: systematic review* by Bolland *et al.* (Sept 2015)

# Systematic Review

Reference: [BMJ](#). 2015 Sep 29;351:h4580. doi: 10.1136/bmj.h4580

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## **STUDY Question**

**Patients:** Aged >50

**Intervention:** Increased dietary calcium, milk or dairy intake, or calcium supplements (with or without vitamin D)

**Comparison:** Normal diet

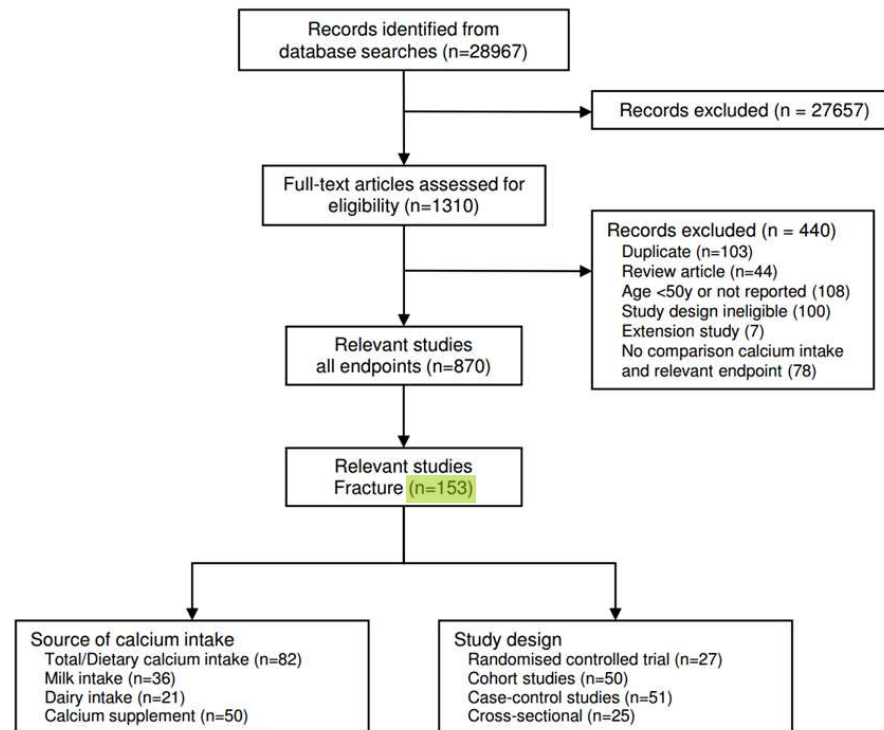
**Outcome:** Rate of fractures (fracture as an endpoint)

# Quality of the review

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- **Q** - Clearly framed question
- **F**
  - + Use of professional librarian, appropriate search strategy!
  - + Used Mediline and Embase
  - - Did not contact experts
  - - No discussion of unpublished literature

# Study selection



## □ Dietary calcium

- 2 RCTs
- **44 cohort**

## □ Calcium supplements

- 26 RCTs
- 11 cohort studies

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- **A**
  - Investigated bias (Cochrane guidelines)
  - Two independent authors involved in data extraction

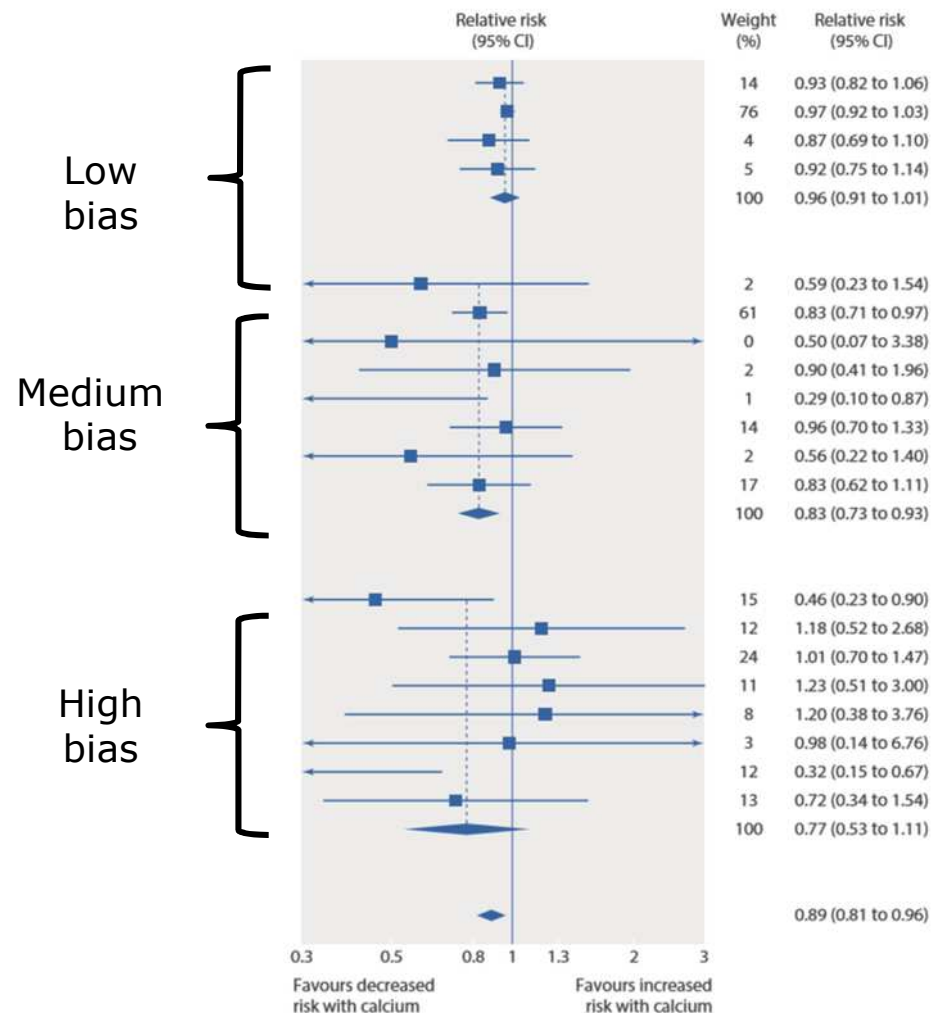
# Risk of bias – calcium supplement RCTs

**Table B:** Risk of bias assessment for randomised controlled trials

Trial	Random Sequence generation described	Allocation concealment	Blinding of participant/personnel	Blinding of outcome assessment	Incomplete outcome data	Differential drop out	Other bias	Primary endpoint	Funding	Investigator conflict of interest	Overall assessment of risk of bias
Inkovaara 1983 <sup>13</sup>	Quasi (DOB)	Yes	Double-blind	Yes	No	No	Yes <sup>b</sup>	No	NS	Yes	High
Hansson 1987 <sup>73</sup>	NS	NS	NS	NS	No	No	No	No	IF	NS	Moderate
Chapuy 1992,1994 <sup>15,16</sup>	NS	NS	NS	NS	No	No	Yes <sup>c</sup>	Yes	IF, Tab	NS	Moderate
Reid 1993,1995 <sup>74,75</sup>	NS	NS	Double-blind	Yes	No	No	Yes <sup>d</sup>	No	IF, Tab	NS	Moderate
Chevalley 1994 <sup>21</sup>	NS	NS	Double-blind	Yes	No	No	No	No	IF, Tab, IF, Ind,	No	Moderate
Recker 1996 <sup>76</sup>	NS	NS	Double-blind	Yes	Yes	NS	No	Yes	Tab	Yes	High
Dawson-Hughes 1997 <sup>77</sup>	NS	NS	Double-blind	Yes	Yes	No	No	No	IF	NS	High
Riggs 1998 <sup>78</sup>	NS	NS	Double-blind	Yes	No	No	No	No	IF, Tab	NS	Moderate
Baron 1999 <sup>79,80</sup>	Yes	Yes	Double-blind	Yes	No	No	No	No	IF, Tab	No	Moderate
Ruml 1999 <sup>81</sup>	NS	NS	Double-blind	Yes	No	Yes	No	No	IF, Tab, IF, Ind,	No	High
Peacock 2000 <sup>82</sup>	NS	NS	Double-blind	Yes	Yes	No	No	No	Tab	NS	High
Lau 2001 <sup>20</sup>	NS	NS	No	NS	No	Yes	No	No	Ind	NS	High
Chapuy 2002 <sup>83</sup>	NS	NS	Double blind	Yes	Yes	No	Yes <sup>e</sup>	No	Ind	Yes	High
Avenell 2004 <sup>84</sup>	NS	NS	No	Yes	No	Yes	No	No	IF, Tab	NS	High
Fujita 2004 <sup>85</sup>	NS	NS	Double-blind	Yes	Yes	No	No	No	NS	NS	High
Harwood 2004 <sup>86</sup>	Yes	Yes	No	No	No	Yes	Yes <sup>f</sup>	No	Ind	NS	High
Larsen 2004 <sup>14</sup>	Quasi (location)	No	No	Yes	No	No	No	Yes	IF, Tab	No	High
Grant 2005 <sup>87</sup>	Yes	Yes	Double blind	Yes	No	No	No	Yes	IF, Tab	Yes	Low
Porthouse 2005 <sup>88</sup>	Yes	Yes	No	No	No	No	No	Yes	IF, Tab	Yes	Moderate
Jackson 2006 <sup>9</sup>	NS	NS	Double-blind	Yes	No	No	Yes <sup>g</sup>	Yes	IF, Tab	Yes	High (hip) Low (others)
Prince 2006 <sup>89</sup>	Yes	Yes	Double-blind	Yes	No	No	No	Yes	IF	No	Low
Reid 2006 <sup>90</sup>	Yes	Yes	Double-blind	Yes	No	No	No	Yes	IF, Tab	NS	Low
Bolton-Smith 2007 <sup>91</sup>	Yes	NS	Double-blind	Yes	No	Yes	Yes <sup>f</sup>	No	IF, Tab	No	High
Bonnick 2007 <sup>92</sup>	NS	NS	Double-blind	Yes	No	No	Yes <sup>f</sup>	No	Ind	Yes	High
Reid 2008 <sup>93</sup>	Yes	Yes	Double-blind	Yes	No	No	No	No	IF, Tab	Yes	Moderate
Salovaara 2010 <sup>94</sup>	Yes	NS	No	No	No	No	No	Yes	IF, Tab	No	Moderate
Sambrook 2012 <sup>18</sup>	Yes	Yes	No	No	No	No	No	No	IF	No	High

# Key Results & application to patient

fig 1 | random effects models of effect of calcium supplements on risk of total fracture. trials with no events are not included in meta-analyses



\* P < 0.05



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- **S** – Did meta analysis, made forest plot

# Key Results & application to patient

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## Benefits

- Overall there may be a small decrease in the risk of fracture with calcium supplementation

## Risks

- ^ likelihood of hospitalisation for acute GI symptoms
- Development of kidney stones
- ^ CV risk
- Side effects - constipation

## **Recommendation**

In general population >50 there is an unfavourable risk:benefit profile and so would not advise increased calcium intake or supplements

However frail elderly women in residential care with low dietary calcium and vitamin D may benefit from supplementation