RESEARCH

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RYAN PYLE/CORBIS

THIS WEEK'S RESEARCH QUESTIONS

185 Did construction of a barrier at a "suicide" bridge decrease the rate of suicides by jumping in Toronto?

186 Does the method used at an unsuccessful suicide attempt predict later completed suicide?

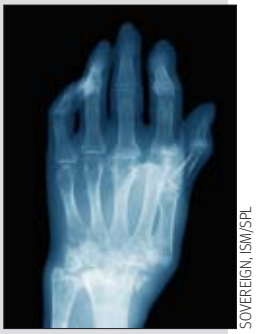
187 What are the risks of preterm birth and low birth weight in overweight or obese mothers?

188 Is testing stools for faecal calprotectin useful in the investigation of suspected inflammatory bowel disease?

189 How is incident wrist fracture associated with functional status in women older than 65?

Effect of wrist fractures on day to day life

Fracturing your wrist could affect many crucial day to day activities, such as carrying heavy objects, cutting food, turning keys, and opening and closing taps. Not much is known about the long term effects of wrist fracture though; previous studies have been limited by small sample size.


SOVEREIGN, ISM/SPL

Beatrice Edwards and colleagues studied nearly 10 000 women aged 65 years and older, 268 (4.4%) of whom fractured their wrist over seven and a half years of follow-up (p 189). Those who fractured their wrist were substantially more likely to struggle with activities of daily living, like climbing stairs, than those who did not. In fact, the effect of fracturing a wrist was roughly equivalent to having had a fall or a diagnosis of arthritis or diabetes mellitus.

Suicide: risk and restriction

Barriers on bridges might not reduce overall rates of suicide by jumping if people are able to find an alternative location for their suicide attempt, suggest the findings of a "natural experiment" by Mark Sinyor and colleagues (p 185). They studied the effect of a suicide barrier at the Bloor Street Viaduct in Toronto, the bridge with the world's second highest annual rate of suicide by jumping after Golden Gate Bridge in San Francisco. They found that the overall rate of suicide (by any means) in the city fell after construction of the barrier, and that the suicide rate at the viaduct fell to zero after the barrier was constructed. However, rates of suicide from jumping in the region remained the same. Editorialists David Gunnell and Matthew Miller says that although restriction may not work everywhere, "where and when means restriction works, it may save more lives than other suicide prevention strategies, especially in children and young adults, who tend to act impulsively in fleeting suicidal crisis" (p 157).

Meanwhile, in a long term cohort study in Sweden (p 186), Bo Runeson and colleagues found that the method used at an unsuccessful suicide attempt predicted later completed suicide, after adjustment for sociodemographic confounding and psychiatric disorder. Intensified aftercare is warranted after suicide attempts involving hanging, drowning, firearms or explosives, jumping from a height, or gassing, compared with poisoning, say the authors. In the accompanying editorial (p 158) Keith Hawton cautions that although use of more lethal methods of self harm is an important index of suicide risk, it should not obscure the fact that self harm in general is a key indicator of an increased risk of suicide.

LATEST RESEARCH: For these and other new research articles see http://www.bmj.com/channels/research.dtl


JAMES STEVENSON/SPL

Time of birth and risk of death

Out of hours primary care has been under the spotlight recently, but a new retrospective cohort study suggests that out of hours maternity care also deserves scrutiny. In their study of singleton term births at Scottish maternity hospitals, Dharmintra Pasupathy and colleagues found that babies born outside of the hours 09.00-17.00 Monday to Friday were significantly more likely to die around the time of birth than those born during "office hours." They estimated out of hours deliveries were responsible for an additional one to two extra deaths per 10 000 live births. They suggest that staffing, immediate availability of senior clinicians, and access to clinical facilities could contribute to this disparity (doi:10.1136/bmj.c3498).

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Effect of a barrier at Bloor Street Viaduct on suicide rates in Toronto: natural experiment

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EDITORIAL by Gunnell and Millar
PERSONAL VIEW, p 204

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Cite this as: *BMJ* 2010;341:c2884
doi: 10.1136/bmj.c2884

This is a summary of a paper that was published on bmj.com as *BMJ* 2010;341:c2884

STUDY QUESTION Did construction of a barrier at Bloor Street Viaduct in Toronto, the second most used bridge for suicide in the world, decrease rates of suicide by jumping in the city?

SUMMARY ANSWER Although no further suicides occurred at Bloor Street Viaduct after the barrier had been constructed, suicide rates by jumping remained unchanged in Toronto owing to a statistically significant increase in suicides from other bridges and a non-significant increase in suicides from buildings.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS Barriers are known to decrease or eliminate suicides at bridges commonly used for suicide, although it is unclear whether barriers prevent suicides or if people simply substitute one bridge for another or use other means of suicide. This work suggests that barriers on bridges may not alter absolute rates of suicide by jumping when comparable bridges are nearby.

Participants and setting

This study analysed 14 789 people who completed suicide in Toronto and Ontario.

Design, size, and duration

We reviewed the records at the chief coroner's office of Ontario from 1993 to 2001 (nine years before the barrier) and from July 2003 to June 2007 (four years after the barrier) to determine how many people completed suicide in Toronto by jumping from bridges or buildings or used other means for suicide. Rates were corrected for population based on census data. Poisson regression analyses were carried out to examine differences between suicide rates before and after the barrier.

Main results and the role of chance

In the period after the barrier suicide rates decreased in the province of Ontario and in the city of Toronto overall, and in Toronto by means other than jumping. Annual rates of suicide by jumping in Toronto before and after the barrier, however, remained the same (56.4 *v* 56.6, P=0.95). A mean of 9.3 suicides occurred annually at Bloor Street Viaduct before the barrier and none after the barrier (P<0.01). Yearly rates of suicide by jumping from other bridges and buildings were higher in the period after the barrier although this was only significant for other bridges (other bridges: 8.7 *v* 14.2, P=0.01; buildings: 38.5 *v* 42.7, P=0.32). For people who completed suicide by jumping, age or sex did not differ between the two periods. More people travelled from outside the city to jump from other bridges in the period after the barrier than from Bloor Street Viaduct before the barrier (P=0.049). Given the low absolute number of suicides by jumping overall in Toronto and at Bloor Street Viaduct, chance variation may have influenced results. However, this is the best powered study of a suicide barrier to date given that Bloor Street Viaduct was the most frequented bridge for suicide after Golden Gate Bridge.

Bias, confounding, and other reasons for caution

We did not examine deaths ruled as homicide unintentional death, or undetermined cause of death. We also cannot rule out that observed differences between the two periods were a result of chance fluctuations in rates, economic changes, social changes, or interventions to restrict suicide by other means.

Generalisability to other populations

The finding that rates were unchanged may be applicable to other cities that have multiple comparable bridges. It is, however, unclear whether this applies to more iconic bridges such as Golden Gate Bridge.

Study funding/potential competing interests

This study received no funding. MS has no competing interests. AJL has acted as a consultant for Janssen Ortho, Biovail, and Eli Lilly Canada.

ANNUAL SUICIDE RATES BEFORE AND AFTER CONSTRUCTION OF A BARRIER AT BLOOR STREET VIADUCT, TORONTO, CORRECTED FOR POPULATION

	Mean No of annual suicides			
Subgroup	Pre-barrier*	Post-barrier†	Change (%)	P value
Toronto (total)	253.4	225.4	−11	0.05
Suicide by jumping	56.4	56.6	0	0.95
Location of jump:				
Building	38.5	42.7	11	0.32
Bridge	17.9	14.2	−26	0.22
Bloor Street Viaduct	9.3	0	−100	<0.01
Other bridges	8.7	14.2	63	0.01
Other means of completing suicide	197.0	168.8	−14	0.04

*1993-2001.
†July 2003-June 2007.

bmj.com/podcasts
Listen to Professor Bo Runeson from the Karolinska Institutet in Sweden discuss how the method of an attempted suicide relates to a later successful attempt at www.bmj.com/podcasts

CME

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Method of attempted suicide as predictor of subsequent successful suicide: national long term cohort study

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EDITORIAL by Hawton
PERSONAL VIEW, p 204

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Cite this as: *BMJ* 2010;340:c3222
doi: 10.1136/bmj.c3222

This is a summary of a paper that was published on bmj.com as *BMJ* 2010;340:c3222

STUDY QUESTION What is the association between the method of an unsuccessful suicide attempt and the risk of subsequent successful suicide?

SUMMARY ANSWER The prognosis after attempted suicide varies according to the initial method used.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Previous suicide attempts constitute a strong risk factor for completed suicide; coexisting psychiatric morbidity and suicidal intent also increase the risk. Compared with poisoning, suicide attempts involving hanging or strangulation, drowning, firearms, jumping from a height, or gassing are associated with a moderate to strong increase in risk.

Participants and setting

People who attempted to commit suicide and were treated in hospital in Sweden in 1973-82.

Design, size, and duration

This nationwide cohort study included 48 649 people admitted to hospital after attempted suicide: 23 538 men and 25 111 women (mean age 38.3 (SD 16.0) years and 37.3 (SD 16.9) years, respectively). We linked the hospital and death registers to compare risk of suicide by index method over a 21-31 year follow-up. All patients were followed from hospital discharge for attempted suicide to a definite or uncertain suicide, death other than suicide, first emigration, or end of follow-up (31 December 2003). Psychiatric morbidity was classified as non-organic psychotic disorder, affective disorder, or other psychiatric disorder. Multiple Cox regression modelling was conducted for each index method, with poisoning as reference category. We computed hazard ratios with 95% confidence intervals, controlling for sociodemographic confounding and co-occurring psychiatric disorder.

Main results and the role of chance

5740 individuals (12%) committed suicide during follow-up. Risk of suicide varied substantially by the method used at the index attempt. Individuals who attempting suicide by hanging, strangulation, or suffocation had the worst prognosis. Risks for gassing, jumping from a height, using a firearm, and drowning were significantly lower than for hanging but still raised.

For poisoning and cutting or piercing as the index method, 26-32% of all completed suicides during follow-up occurred within the first year. This proportion was substantially higher for other methods (53-88%).

When we stratified the index method by co-occurring psychiatric disorder, hanging and comorbid psychotic disorder implied high suicide rates (58/69 (84%) during the entire follow-up and 48/69 (70%) within the first year for men; 27/32 (84) and 22/32 (69%), respectively, for women).

Bias, confounding, and other reasons for caution

By linking nationwide longitudinal registers, we attempted to minimise selection bias and low power seen in previous clinical studies. As the death register covered more than 99% of all deaths in Swedish residents, including those occurring abroad, loss of information on outcome was minimal. We did not study psychiatric comorbidity or repetition of suicide attempts.

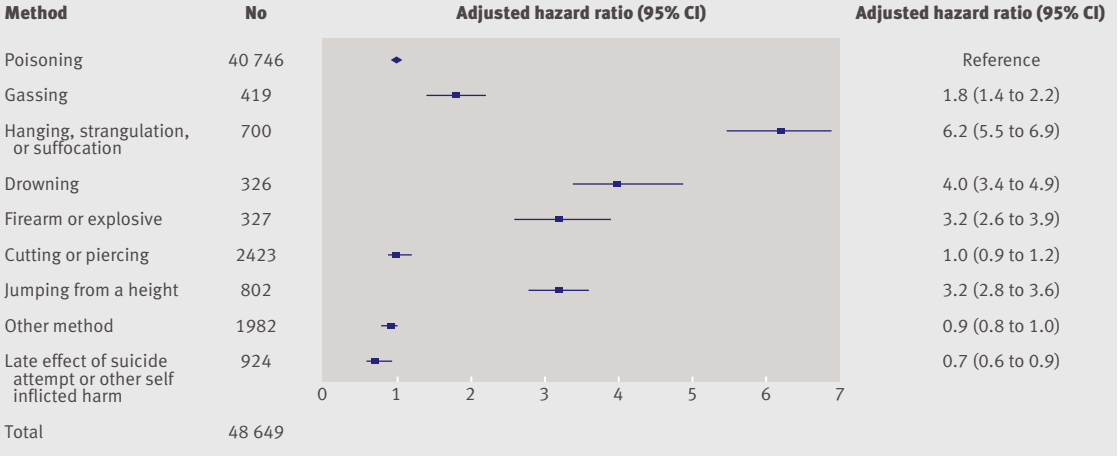
Generalisability to other populations

As we included only people whose attempted suicide led to inpatient care, our results might not be generalisable to suicide attempts not involving inpatient care.

Study funding/potential competing interests

This study was funded by Stockholm County Council and Karolinska Institutet. NL is funded by the Swedish Research Council-Medicine.

RISK OF SUBSEQUENT SUCCESSFUL SUICIDE ACCORDING TO METHOD OF UNSUCCESSFUL INDEX ATTEMPT



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Listen to Kevin Hines discuss his experience of attempting suicide www.bmj.com/podcasts

Overweight and obesity in mothers and risk of preterm birth and low birth weight infants: systematic review and meta-analyses

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Cite this as: *BMJ* 2010;341:c3428
doi: 10.1136/bmj.c3428

This is a summary of a paper that was published on bmj.com as *BMJ* 2010;341:c3428

STUDY QUESTION What is the association of overweight and obesity in mothers and preterm birth and low birth weight in singleton pregnancies in developed and developing countries?

SUMMARY ANSWER Overweight and obese women have increased risks of preterm birth before 32 weeks and induced preterm birth before 37 weeks, and after accounting for publication bias seemed to have increased risks of preterm birth before 37 weeks overall. The beneficial effects of overweight or obesity on low birth weight were greater in developing countries, which disappeared after accounting for publication bias.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS The effect of overweight and obesity in women on risk of preterm birth is debated in the literature, with the uncertainty reflected in national guidelines, although it is widely believed that the risks of low birth weight are decreased. In this systematic review of the published literature, overweight and obese women were at increased risk of preterm birth and were not protected from having an infant of low birth weight.

Selection criteria for studies

We searched Medline and Embase (inception to 2 January 2009) for studies that included a reference group of women with normal body mass index and assessed the effect of overweight and obesity on preterm birth and low birth weight. Additional studies were found through reference lists of identified articles. We meta-analysed both crude and separately, adjusted dichotomous data from cohort studies using relative risks, and we pooled crude and matched dichotomous data from case-control studies using odds ratios. Sensitivity analyses planned a priori included the effect of material wellbeing (developed versus developing countries). To address potential publication bias we showed results without as well as with imputation, using Duval and Tweedie's trim and fill method for estimating and adjusting for the number and outcomes of missing studies in a meta-analysis. We carried out the trim and fill analyses for outcomes with at least 10 studies to avoid concerns about reliability for outcomes with fewer studies.

Primary outcome(s)

The primary outcomes were preterm birth (before 37 weeks) and low birth weight (<2500 g).

Main results and role of chance

Eighty four studies (64 cohort, 20 case-control) were included, totalling 1 095 834 women. The risks of preterm birth in overweight and obese women were increased before 32 weeks and, after accounting for publication bias, before 37 weeks (relative risk 1.24, 95% confidence interval 1.13 to 1.37). The decrease in the risk of having an infant of low birth weight in overweight and obese women in developing countries (0.58, 0.47 to 0.71) was greater than that in developed countries (0.90, 0.79 to 1.01).

Bias, confounding, and other reasons for caution

Limitations of the review include potential residual confounding from factors such as smoking. Gestational weight gain, which was not taken into account by most of the studies, can influence outcomes.

Study funding/potential competing interests

This work was supported by a Canadian Institute of Health Research (CIHR) operating grant (No KRS 86242). SDMcD is supported by a CIHR new investigator salary award. ZH is supported by a state scholarship fund by the China Scholarship Council. JB is supported by a CIHR grant (No 84392). None of the funding sources had any role in analyses, writing of the report, interpretation of data, or the decision to submit the manuscript.

KEY OUTCOMES IN COHORT STUDIES OF OVERWEIGHT AND OBESE WOMEN COMPARED WITH WOMEN OF NORMAL WEIGHT

Outcome	No of studies	Crude relative risk (95% CI)	No of studies	Adjusted relative risk (95% CI)	Trim and fill analyses using crude estimates (95% CI)
Preterm birth <37 weeks†	38	1.06 (0.87 to 1.30)	4	1.02 (0.68 to 1.54)	1.24* (1.13 to 1.37); 9 studies imputed
Preterm birth <32 weeks	11	1.26 (1.14 to 1.39)	2	1.23 (0.87 to 1.72)	No additional studies imputed
Spontaneous preterm birth	15	0.93 (0.85 to 1.01)	1	2.29* (1.20 to 4.38)	0.89* (0.81 to 0.97); 4 studies imputed
Induced preterm birth	5	1.30* (1.23 to 1.37)	2	1.30 (0.70 to 2.43)	Not applicable (<10 studies)
Low birth weight	28	0.84 (0.75 to 0.95)	4	0.70 (0.53 to0.93)	0.95 (0.85 to 1.07); 9 studies imputed

*P<0.05.
†Spontaneous, induced, or unspecified.

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Faecal calprotectin for screening of patients with suspected inflammatory bowel disease: diagnostic meta-analysis

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EDITORIAL by Logan

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Cite this as: *BMJ* 2010;341:c3369
doi: 10.1136/bmj.c3369

This is a summary of a paper that was published on bmj.com as *BMJ* 2010;341:c3369

STUDY QUESTION Is testing stools for faecal calprotectin useful in the investigation of suspected inflammatory bowel disease?

SUMMARY ANSWER Screening with a faecal calprotectin test was sensitive and specific and reduced the number of unnecessary endoscopic procedures in both adults and children and teenagers with suspected inflammatory bowel disease, but also delayed diagnosis in a small proportion.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Faecal calprotectin is a sensitive marker of intestinal inflammation. An increased level of faecal calprotectin identifies those patients who are most likely to have inflammatory bowel disease and justifies urgency for endoscopy.

Selection criteria for studies

We searched Medline and Embase up to October 2009 for diagnostic accuracy studies that compared faecal calprotectin (index test) with endoscopy (reference standard). The meta-analysis included studies that had collected data prospectively in patients with suspected inflammatory bowel disease and allowed for construction of a two by two table.

Primary outcomes

Sensitivity and specificity of the faecal calprotectin test.

Main results and role of chance

Six studies in adults (n=670) and seven in children and teenagers (n=371, age range 10 months to 19.9 years) were included in the meta-analysis. Inflammatory bowel disease was confirmed by endoscopy in 32% (n=215) of adults and 61% (n=226) of children and teenagers. The pooled sensitivity and pooled specificity of calprotectin in the adult studies was 0.93 (95% confidence interval 0.85 to 0.97) and 0.96 (0.79 to 0.99) and in the studies of children and teenagers was 0.92 (0.84 to 0.96) and 0.76 (0.62 to 0.86). The lower specificity in the studies of children and teenagers was significantly different from that of the studies in adults (P=0.048).

Bias, confounding, and other reasons for caution

We included studies that used endoscopy with histopathological verification of segmental biopsies along with two studies in adults without mucosal sampling. It is possible that some patients were misclassified as a result of a macroscopically normal appearance of the mucosa, whereas microscopic evaluation would have revealed abnormalities typical of the disease. Owing to the limited number of included studies we were not able to assess the effect of different cut-off values. Most studies used the cut-off as advised by the manufacturer (50 µg/g). All studies except one were carried out in tertiary care, where the pretest probability of inflammatory bowel disease is higher than in primary care. We are reserved about the utility of faecal calprotectin screening at primary care level and discourage its use to screen asymptomatic patients.

Implications of key findings

Screening by measuring faecal calprotectin levels would reduce the number of adults requiring endoscopy by 67%. Three of 33 adults who go on to have endoscopy will not have the disease, but may have an organic disorder for which endoscopy is inevitable. The downside of this screening strategy is delayed diagnosis in 6% of adults because of a false negative test result. In the population of children and teenagers 65 instead of 100 will undergo endoscopy. Nine of them will not have inflammatory bowel disease, and diagnosis will be delayed in 8% of affected patients.

Study funding/potential competing interests

This study received no funding. We have no competing interests.

CONSEQUENCES OF POOLED TEST PERFORMANCE OF FAECAL CALPROTECTIN ON PATIENT OUTCOME

Test result	No per 100 adults (IBD prevalence 32%)	No per 100 children and teenagers (IBD prevalence 61%)	Presumed influence on patient outcome
True positive	30	56	Benefit: shorter delay and early treatment
True negative	65	30	Benefit: reassurance and unnecessary invasive procedure avoided
False positive	3	9	Detriment: exposure to invasive procedure; may benefit from endoscopy for correct diagnosis
False negative	2	5	Detriment: delayed diagnosis

IBD=inflammatory bowel disease.

Functional decline after incident wrist fractures—Study of Osteoporotic Fractures: prospective cohort study

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Cite this as: *BMJ* 2010;341:c3324
doi: 10.1136/bmj.c3324

This is a summary of a paper that was published on bmj.com as *BMJ* 2010;341:c3324

STUDY QUESTION What is the effect of an incident wrist fracture on functional status in women aged over 65 years?

SUMMARY ANSWER Wrist fractures contribute to clinically important functional decline in older women.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS Wrist fractures are the most common upper extremity fractures in older adults, and most often result from a fall sustained while walking when the person is still healthy, active, and functionally independent. A wrist fracture was associated with a 48% increased risk of development of clinically important functional decline, so wrist fractures may play a role in the development of disability in older people .

Participants and setting

The Study of Osteoporotic Fractures is an ongoing US multicentre prospective cohort study that evaluates risk factors for hip fracture in 9704 primarily white women aged 65 years and older.

Design, size, and duration

This is an ongoing study with clinics established in four clinical sites. Women participated in standardised interviews and clinical examinations approximately every two years. We included in this analysis 6107 women without previous hip fracture or wrist fracture and without severe functional impairment at baseline. We defined the incident wrist fracture study group as women with a new (incident) fracture after visit 1, and we considered the women without incident fracture as the control group. We assessed functional difficulty by a total score of 0-15 across five activities of daily living (meal preparation, heavy housekeeping, ability to climb 10 stairs, shopping, and getting out of a car). We defined clinically important functional decline as a deterioration in functional score of 5 points or more or the equivalent change of one standard deviation.

Main results and the role of chance

Follow-up was 99% complete. The mean follow-up was 7.6 (range 1.3-12.0) years, and 268 (4.4%) women had an incident wrist fracture; their mean duration of functional follow-up after the wrist fracture was 6.3 (range 1.0-9.5) years. The mean interval from occurrence of wrist fracture to biannual examination was 1.1 years (SD 3 months; range 6-19 months). Among the 268 women who had initial wrist fracture, 41 (15%) had clinically significant functional decline, compared with 714 (12.2%) controls (P=0.02). Wrist fracture was an important predictor of functional decline after adjustment for age, body mass index, health status, comorbidities, and neuromuscular function (odds ratio 1.48, 1.04 to 2.12). The magnitude of functional decline attributed to incident wrist fracture was similar to those seen for falls (odds ratio 1.58, 1.28 to 1.95), arthritis (1.48, 1.23 to 1.79), and diabetes mellitus (1.36, 1.04 to 1.78).

Bias, confounding, and other reasons for caution

Health status was self reported, and we lacked information on the severity of comorbid conditions. We were therefore limited in our ability to assess the impact of comorbidities on the fracture related disability. Additionally, functional outcomes were measured every two years, which limited the capacity of these analyses to evaluate short term disability after wrist fractures or to evaluate the trajectory of recovery or decline after a wrist fracture.

Generalisability to other populations

The study took place in a predominantly white, community dwelling population, so the findings may not apply to men, to women living in institutions or in poor health, or to other ethnic groups.

Study funding/potential competing interests

Funding was provided by the National Institutes of Health NIAMS and NIA under the grant numbers AG05407, AR35582, AG05394, AR35584, AR35584, AR35583,R01 AG005407, 2R01 AG005394-22A1, and 2R01 AG027574-22A1.

RELATION OF WRIST FRACTURE TO CLINICALLY IMPORTANT FUNCTIONAL DECLINE

Adjustment factors	Odds ratio of clinically significant functional decline related to incident wrist fracture (95% CI)*
Unadjusted	1.51 (1.05 to 2.14)
Adjusted for age, body mass index, health status	1.66 (1.17 to 2.36)
Adjusted for age, body mass index, health status, comorbidities†, and neuromuscular function‡	1.48 (1.04 to 2.12)

*Multiple logistic regression analysis showing odds ratio for functional decline in next year for people with incident wrist fracture compared with those without wrist fracture.
†Chronic obstructive pulmonary disease, arthritis, diabetes mellitus, stroke, Parkinson's disease.
‡Depth perception, visual acuity, visual contrast sensitivity, grip strength, maximum knee extension, hip abduction, maximum triceps extension, chair stand, foot tapping, uses arms to stand up.