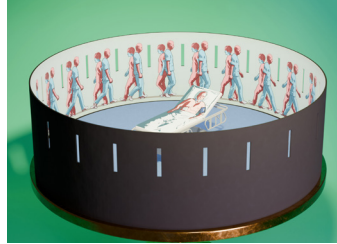


research



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ORIGINAL RESEARCH Swedish nationwide register based emulated target trial

Contemporary menopausal hormone therapy and risk of cardiovascular disease

Johansson T, Karlsson T, Bliuc D, et al

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Study question Does the use of contemporary menopausal hormone therapy, including the route of administration and hormone combination, affect the risk of cardiovascular disease?

Methods This nationwide cohort study analysed data from 919 614 women aged 50-58 in Sweden between 2007 and 2020, aiming to mimic the conditions of a randomised clinical trial by using an emulated target trial approach. Women were grouped into one of eight treatment strategies on the basis of their prescription register data: oral combined continuous, oral combined sequential, oral unopposed oestrogen, oral oestrogen with levonorgestrel intrauterine system, tibolone, transdermal combined, transdermal unopposed oestrogen, or non-initiators of menopausal hormone therapy.

Study answer and limitations A total of 77 512 women were initiators of any menopausal hormone therapy and 842 102 women were non-initiators; 24 089

women had an event recorded during follow-up. Oral oestrogen-progestin therapy was associated with an increased risk of ischaemic heart disease (hazard ratio 1.21, 95% confidence interval 1.00 to 1.46) and venous thromboembolism (1.61, 1.35 to 1.92). Tibolone use, however, was associated with an increased risk of arterial thrombotic events, including ischaemic heart disease (1.46, 1.00 to 2.14), cerebral infarction (1.97, 1.02 to 3.78), and myocardial infarction (1.94, 1.01 to 3.73), but not venous thromboembolism. Differentiating between the various types of progestins used in menopausal hormone therapies was not possible, so the specific effect of different progestins on cardiovascular disease risk could not be assessed.

What this study adds Different contemporary menopausal hormone therapy formulations and delivery methods have varying effects on the risk of cardiovascular disease. Oral oestrogen-progestin therapy increased the risk of heart disease and venous thromboembolism, whereas tibolone was linked to higher risks of arterial thrombotic events.

Funding, competing interests, and data sharing This study was funded by the Swedish Brain Foundation, FGS Fang Foundation, Swedish Heart-Lung Foundation, Swedish Research Council, and Uppsala University's WOMHER centre. No competing interests declared. Data can be requested from Statistics Sweden and the National Board of Health and Welfare, subject to ethical approval.

Staff retention and mortality

ORIGINAL RESEARCH Retrospective longitudinal study



MALCOLM WILLET

Nurse and doctor turnover and patient outcomes in NHS acute trusts in England

Moscelli G, Mello M, Sayli M, Boyle A

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Study question What is the association between hospital clinical staff turnover and patient mortality?

Methods The study included only patients admitted to, and clinical workers employed by, 148 English NHS acute care (non-specialist, non-community) hospital trusts, during the nine years from 1 April 2010 to 31 March 2019. The two main variables of interest were the turnover rates for nurses and senior doctors in the NHS hospital trusts, constructed at a monthly level from monthly administrative

payroll records. Four risk adjusted hospital quality indicators were used and measured at a monthly frequency on a percentage scale: mortality risk, in or outside the hospital, within 30 days from all cause, emergency, and elective admission to hospital; and risk of unplanned emergency readmission within 30 days from discharge after elective hospital treatment.

Study answer and limitations A 1 standard deviation (SD) increase in turnover rate for nurses was associated with 0.035 (95% confidence interval 0.024 to 0.045) and 0.052 (0.037 to 0.067) percentage point increases in risks of all cause and emergency admission mortality, respectively, at 30 days. The corresponding values for senior doctors were 0.014 (0.005 to 0.024) and 0.019 (0.006 to 0.033) percentage point increases. Although

COMMENTARY The importance of continuity of care

Previous research suggests that survival of patients may be associated with hospital organisational culture.¹

Organisational factors such as culture, staffing, and retention of staff are crucial to patient safety. In their study covering nine years of monthly data from all NHS acute trusts in England, Moscelli and colleagues showed that a high turnover of senior doctors (hospital consultants and specialty associated doctors) and nurses in hospitals is associated with increased mortality for patients admitted for emergencies.² For the 30 day mortality risk, a 1 standard deviation increase in the monthly turnover rate of nurses was associated with a 0.052 (0.037 to 0.067) percentage point increase and of senior doctors was a 0.019 (0.006 to 0.033) percentage point increase. Extensive robustness

checks give credibility to the findings, although such associations cannot be taken as proof of causality.

Turnover rates among nurses showed a stronger association with mortality than turnover rates among doctors. One potential explanation is that while doctors usually meet patients one to one, nurses more often work in teams, which may be disrupted by high turnover rates.³

No significant association was reported between staff turnover and mortality for elective patients. As the authors suggest, this difference may be explained by the fact that elective patients have a lower mortality risk than patients in emergency departments. It should also be noted that well practised processes are especially important in emergency settings where time is crucial.⁴ Decisions must be taken quickly and under stress. Therefore, patients in emergency departments might be particularly susceptible



LIFE IN VIEW/SPL

Turnover among nurses likely represents a larger challenge than turnover among doctors

to when the staff is less experienced or not well settled into their team.

Although not discussed in Moscelli and colleagues' article, staff turnover may be seen as a measure of continuity, especially in primary care. In general practice, continuity is usually defined as the personal relation between doctor and patient over time, and might reduce mortality

and the need for emergency admissions.⁵⁻⁷ Additionally, inpatients with a high risk of death may benefit from personal continuity with a doctor during their hospital stay.⁸

Information and management continuity

Information continuity and management continuity are also affected by high turnover. Information continuity implies adequate access to all relevant information about the patient, such as medical history, current

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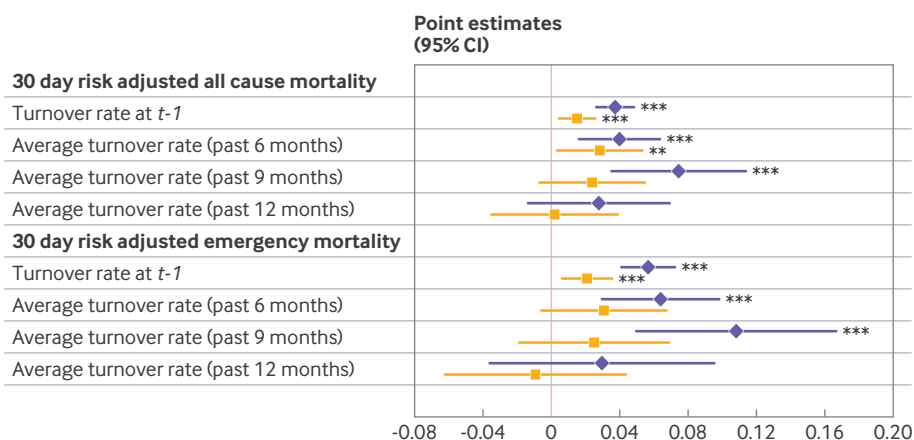
the results are robust to several different specifications and sensitivity analyses, other sources of confounding might explain the findings of this study. Additional evidence on the causal nature of these associations is needed.

What this study adds Higher monthly turnover rates of hospital nurses and senior doctors were associated with higher mortality risks for patients after emergency admission to hospital.

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Study registration Integrated Research Application System project ID 271302.

◆ Association with nurse turnover rate ■ Association with senior doctor turnover rate



Association of hospital staff turnover rates with hospital mortality, at different time lags. Hospital quality outcome is 30 day risk adjusted mortality risk. The first and fifth values report the baseline estimates of the association of interest. The second to fourth and sixth to eighth values report the estimates of interest using the hospital mortality risk smoothed between t-1 and t+1 (according to a moving average of order 3) as hospital quality outcome, and the lagged hospital staff turnover rates and levels, respectively, smoothed over 6, 9, and 12 months as variable of interest. Vertical bars are 95% CIs based on heteroskedasticity and autocorrelation consistent robust standard errors, clustered at NHS hospital trust level. Significance level: **P<0.05; ***P<0.01. Sample size was 13 040 monthly NHS hospital trust observations (from April 2010 to March 2019 included). CI=confidence interval

medications, allergies, and treatment plans. Comprehensive information reduces the risk of medical errors, adverse drug interactions, repeated unnecessary investigations, and inappropriate treatment. This type of continuity depends heavily on robust electronic health record systems, which are now in place in most modern healthcare systems.⁹

Management continuity implies that different providers deliver timely and complementary services that patients experience as connected and coherent.^{10 11} Such continuity depends on adherence to clinical guidelines, local adaptations and procedures, standardised care protocols, and an experienced staff. When

management continuity is high, coordination and information sharing are improved, with fewer misunderstandings and mistakes.

Turnover risks

Retention of nurses can substantially benefit patient outcomes and quality of care.¹² Conversely, with high turnover, management continuity will be affected. New members of staff might need time to become acquainted in new surroundings and to develop trust among colleagues. Remaining staff may be overburdened because they must train new colleagues in addition to caring for patients. High turnover risks creating a vicious circle of understaffing, stress, dissatisfaction, burnout, and even higher turnover.

The turnover rates for nurses and doctors in England were almost similar,² whereas US studies have indicated that rates for nurses are generally much higher than those for physicians.¹³ Still, turnover among nurses likely represents a larger challenge than turnover among doctors, as indicated by Moscelli and colleagues.

Some level of turnover is unavoidable but should otherwise be as low as possible. Continuity is a major challenge for managers and policymakers who must find ways to increase retention of health staff.¹⁴ To begin with, retention depends on a streamlined onboarding process for new nurses and doctors. Employers need to invest in personal and professional development

and training programmes for their staff. Mentoring by experienced colleagues is necessary, and novice nurses need collegial support.¹⁵ A supportive leadership and work environment may also help to identify issues before they become major problems. Appropriate financial compensation is also an issue that can lead to turnover and cannot be ignored.¹⁶

The message for hospital managers and policymakers is clear.² High turnover of nurses and doctors suggests a potential risk for patients. Therefore, retention of healthcare staff should be a priority to improve continuity and quality of care for patients.

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Interventions for the management of long covid (post-covid condition)

Zeraatkar D, Ling M, Kirsh S, et al
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Study question What is the comparative effectiveness and safety of interventions for the management of long covid (post-covid condition)?

Methods Medline, Embase, CINAHL, PsycInfo, Allied and Complementary Medicine Database, and Cochrane Central Register of Controlled Trials were searched from inception to December 2023 for trials that randomised adults (≥18 years) with long covid to drug or non-drug interventions, placebo or sham, or usual care. Reviewers worked independently and in duplicate to screen search records, extract data from eligible trials, and assess risk of bias. Although network and pairwise meta-analyses were planned, it was not possible to pool findings owing to limited numbers of trials for nearly all interventions and outcomes. The certainty

(quality) of evidence was assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach.

Study answer and limitations 24 trials with 3695 patients with long covid were eligible. Moderate certainty evidence suggested that, compared with usual care, an online programme of cognitive behavioural therapy (CBT) probably reduces fatigue (mean difference -8.4, 95% confidence interval (CI) -13.11 to -3.69; Checklist for Individual Strength fatigue subscale; range 8-56, higher scores indicate greater impairment) and probably improves concentration (-5.2, -7.97 to -2.43; 4-28; Checklist for Individual Strength concentration problems subscale; range 4-28; higher scores indicate greater impairment). Moderate certainty evidence suggested that, compared with usual care, an online, supervised, combined physical and mental health rehabilitation programme probably leads to improvement in overall health, with an estimated 161 more patients per 1000 (95% CI 61 more to 292 more) experiencing meaningful improvement or recovery, probably reduces

symptoms of depression (-1.50, -2.41 to -0.59; Hospital Anxiety and Depression Scale depression subscale; range 0-21; higher scores indicate greater impairment), and probably improves quality of life (0.04, 0.00 to 0.08; Patient-Reported Outcomes Measurement Information System 29+2 Profile; range -0.022-1; higher scores indicate less impairment). No compelling evidence supported the effectiveness of other interventions. Evidence for management of long covid is rapidly emerging and new data are likely to affect the findings.

What this study adds Moderate certainty evidence suggested that CBT and physical and mental rehabilitation probably improve the symptoms of long covid. To maximise applicability, future trials should replicate these findings and include patients with a range of different phenotypes of long covid.

Funding, competing interests, and data sharing
 Funded in part by the Long Covid Web and the Canadian Institutes of Health Research. No competing interests declared. Data to support the findings of this research are publicly available.

Study registration Open Science Framework
<https://osf.io/9h7zm/>.

Comparison	Effect estimates. Mean difference or risk difference per 1000 people (95% CI)						
	Recovery or important improvement	Fatigue	Physical function	Cognitive function	Mental health	Quality of life or wellbeing	Serious adverse events
Physical and mental health rehabilitation programme v usual care	161 more per 1000 (61 more to 292 more) 1.55 (1.21 to 2)*	-2 (-3.96 to -0.04) PROMIS - fatigue subscore (mean 50 (SD 10); higher scores indicate greater impairment)	0.5 (-1.01 to 2.01) PROMIS - physical function abilities subscore (mean 50 (SD 10); higher scores indicate less impairment)	1 (-0.44 to 2.44) PROMIS - cognitive function abilities subscore (mean 50 (SD 10); higher scores indicate less impairment)	-1 (-1.98 to -0.02) HADS anxiety subscale (range 0-21; higher scores indicate greater impairment) -1.5 (-2.41 to -0.59) HADS depression subscale (range 0-21; higher scores indicate greater impairment)	0.04 (0 to 0.08) PROPr health related quality of life (range -0.022-1; higher scores indicate less impairment)	20 more per 1000 (10 fewer to 50 more)
CBT v usual care	371 more per 1000 (124 more to 773 more) RR: 2.43 (1.48 to 3.98)†	-8.4 (-13.11 to -3.69) CIS fatigue subscale (range 8-56; higher scores indicate greater impairment)	4.9 (-1.89 to 11.69) SF-36 physical function subscale (range 0-100; higher scores indicate less impairment)	-5.2 (-7.97 to -2.43) CIS concentration problems subscale (range 4-28; higher scores indicate greater impairment)			0 more per 1000 (30 fewer to 30 more)

GRADE ratings and interpretation	High certainty	Definitely more effective	Definitely worse	Definitely no different
	Moderate certainty	Probably more effective	Probably worse	Probably no different
	Low certainty	May be more effective	May be worse	May be no different

Effects of a physical and mental health rehabilitation programme and of CBT compared with usual care on symptoms of long covid. CBT=cognitive behavioural therapy; CI=confidence interval; CIS=Checklist for Individual Strength; HADS=Hospital Anxiety and Depression Scale; PROMIS=Patient-Reported Outcomes Measurement Information System; PROPr=PROPr 29+2 Profile version 2.1; RR=Relative Risk; SF-36=Short Form-36