The potency of team-based care interventions for hypertension: a meta-analysis
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CRD summary
This review concluded that interventions involving nurses or pharmacists were effective strategies to improve blood pressure control; several individual components were associated with these improvements. Although the methodology was relatively well reported, lack of detail in terms of control groups, patient characteristics, quality assessment and analytic methods chosen, make it very unlikely that the conclusions can be considered reliable.

Authors' objectives
To review the potency of team-based care, involving nurses or pharmacists, for hypertension.

Searching
The search was based on a previous review (Walsh, et al, 2006, see Other Publications of Related Interest field) that searched MEDLINE from 1980 to July 2003, and citations from the Cochrane Effective Practice and Organisation of Care (EPOC). The MEDLINE search was extended to cover from 1970 to February 2009 (search terms reported in previous review). References of selected papers and the previous review were scanned for additional studies.

Study selection
Any controlled trial with nurse or pharmacist led intervention for hypertension was considered for this review. Eligible study designs were randomised controlled trials (RCTs), cluster randomised controlled trials, quasi-randomised trials, controlled before-and-after studies and interrupted time series (with data from at least three time points pre- and post-intervention).

The intervention was provided by clinical or community pharmacists, or nurses (registered nurses or nurse practitioners where reported); duration of follow-up lasted between three and 24 months. Programme components were varied and included supplying free medications, education about medication, assessing medication compliance, counselling about lifestyle modifications, algorithms for treatment, home visits, medication prescribed by nurse/pharmacist, and laboratory tests ordered. Training in the intervention programme usually consisted of several sessions given by an expert to the nurses/pharmacists, but was not always clearly described. In nearly all of the studies, the intervention included consistent and dedicated case management distinct from traditional nursing or pharmacist duties. The majority (68%) of studies were conducted within the USA. No details were reported on the comparator interventions or the populations studied.

Two reviewers independently assessed full papers for inclusion. Disagreements were resolved by consensus and recourse to a third reviewer where necessary.

Assessment of study quality
The reviewers did not appear to have carried out validity assessment, although drop-out rates were reported.

Data extraction
For each included study, the mean change in systolic or diastolic blood pressure attributable to the intervention was extracted. Blood pressure control was defined as blood pressure lower than 140/90mmHg for uncomplicated patients and lower than 130/80mmHg for those with diabetes mellitus or chronic kidney disease. The net change in blood pressure control rates was extracted and presented as an odds ratio (OR) and 95% confidence interval (CI) for each study. Each study was assigned a 'potency' score according to the predicted potency of the various interventions to affect the outcomes of interest, ranging from 0 (brings about no result) to 10 (brings about best result).

Two reviewers independently extracted data for each study, disagreements were resolved by consensus and recourse to a third reviewer where necessary.
Methods of synthesis
The included studies were divided into three groups to evaluate intervention potency: nursing interventions, pharmacist interventions delivered in community pharmacies, and interventions delivered by clinical pharmacists working in a primary-care office. The mean change in diastolic blood pressure and systolic blood pressure were analysed using a stepwise regression model, and the non-parametric Mann-Whitney test to compare intervention and control groups. The unadjusted odds ratios for blood pressure control were compared using a logistic regression model with one variable and without adjusting for other items. A funnel plot was used to assess publication bias. Sensitivity analysis was used to explore the effects of assigning studies to difference categories when they had multiple intervention delivery strategies, i.e. involved both nurses and community pharmacists.

Results of the review
A total of 37 studies were included (sample size from 26 to 1,534 participants). These included: 15 RCTs and one matched control study for the nursing interventions; five RCTs and one parallel controlled trial for community pharmacists; 12 RCTs and three controlled before-after studies for clinical pharmacists. Drop-out rates ranged from 2 to 62%. Odds ratios were calculated based on 22 trials, as the remaining 15 trials did not report sufficient data to allow the calculation of odds ratios. Publication bias did not appear to be present.

Stepwise regression was used to identify intervention components associated with significant reductions in blood pressure. For systolic blood pressure the intervention components were: pharmacist recommending medication to physician; counselling about lifestyle modification; pharmacist performing the intervention; treatment algorithm used; drug profile/medication history completed; and intervention potency score. For diastolic blood pressure the intervention components were: referral to specialist; education about medications; pharmacist performing the intervention; nurse performing the intervention; and drug profile/medication history completed.

After non-parametric analysis, the only individual component associated with significant reduction in blood pressure was education about blood pressure medications.

Non-parametric analyses did not indicate any significant difference in reduction in systolic blood pressure or diastolic blood pressure between intervention types (nurses, community pharmacists or pharmacists in clinics).

The odds ratios for controlled blood pressure rates were 1.69 (95% CI 1.48 to 1.93) for nursing interventions, 2.89 (95% CI 1.83 to 4.55) for community pharmacists and 2.17 (95% CI 1.75 to 2.68) for pharmacists in primary care clinics.

Cost information
One RCT (n=130 patients) reported on a cost-effectiveness analysis. Clinic visit costs were significantly higher for pharmacist led clinics (p<0.001) compared with physician led clinics but emergency department costs were significantly lower for pharmacist managed patients (p=0.04).

Authors' conclusions
Interventions involving nurses or pharmacists were effective strategies to improve blood pressure control; several individual components were associated with these improvements.

CRD commentary
This review addressed a fairly clear clinical question using updated searches from a previous review (Walsh et al, 2006, see Other Publications of Related Interest field). The original searches included three major databases, but it was not clear if the current review used all of these sources, or if any language restrictions were applied. Consequently, it was not clear whether the current review was vulnerable to publication or language biases. Paper selection and data extraction were performed by two reviewers, which minimised error/bias.

The included studies did not appear to have been quality assessed, which made it difficult to evaluate the reliability of their results. No information was provided on the comparator arms in the current review, and no sample demographics were reported. It appeared from the previous review that 'usual care' was most often the control group, but it may not be the case in the current review, as it included new studies.
Meta-analytic techniques were used for one set of analysis, although considerable heterogeneity appeared to have been present but not reported. The remaining analyses, using logistic and step-wise regression, raise serious concerns, as they appeared to have been carried out without taking into account study randomisation and relative weightings.

Although the review methodology was relatively well reported, the lack of detail in terms of the control groups, patient characteristics, lack of quality assessment and the analytic methods chosen, make it very unlikely that the authors’ conclusions can be considered reliable.

**Implications of the review for practice and research**

**Practice:** The authors stated that implementation of new hypertension guidelines should consider changes in healthcare organisational structure to include important components of team-based care.

**Research:** The authors suggested that future research must take into account the organisational structure in which the intervention occurs, the education level and training of providers, and the individual components of the intervention to facilitate later implementation.

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