



August 2008 – SUPPORT Summary of a systematic review

Do nurse practitioners working in primary care provide equivalent care to doctors?

Nurse practitioners are nurses who have undergone further training, often at graduate level, to work autonomously; making independent diagnoses and treatment decisions. It is important to consider whether the evidence supports the notion that nurse practitioners can substitute for doctors by providing safe, effective, and economical front line management of patients.

Key messages

- **Low to moderate quality evidence indicates that patient health outcomes were similar for nurse practitioners and doctors, but that patient satisfaction and quality of care were better for nurse practitioners.**
- **Moderate quality evidence suggests that nurse practitioners had longer consultations and undertook more investigations than doctors. No significant differences between nurse practitioners and doctors were found regarding numbers of prescriptions, return consultations and referrals.**
- **The studies included in the review were conducted in high-income countries and do not provide high quality evidence of the economic impacts of substituting nurse practitioners for doctors.**



Who is this summary for?

People making decisions concerning substitution of doctors by nurses in primary care.

! This summary includes:

- **Key findings** from research based on a systematic review
- **Considerations about the relevance of this research** for low- and middle-income countries

X Not included:

- Recommendations
- Additional evidence not included in the systematic review
- Detailed descriptions of interventions or their implementation

This summary is based on the following systematic review:

Horrocks S, Anderson E, Salisbury C. Systematic review of whether nurse practitioners working in primary care can provide equivalent care to doctors. *BMJ* 2002;**324**:819-23.

What is a systematic review?

A summary of studies addressing a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise the relevant research, and to collect and analyse data from the included studies.

SUPPORT – an international collaboration funded by the EU 6th Framework Programme to support the use of policy relevant reviews and trials to inform decisions about maternal and child health in low- and middle-income countries. www.support-collaboration.org

Glossary of terms used in this report: www.support-collaboration.org/summaries/explanations.htm

Background references on this topic: See back page.

Background

Low and middle-income countries face a chronic shortage of medical doctors in the public health sector, especially in rural areas. Growing financial pressure to improve the efficiency of health systems is also leading to an increased interest in broadening the scope of practice of nurses. One aspect of this is using nurse practitioners to provide front line care in primary care settings and in emergency departments. Nurse practitioners have been used widely in some high-income countries for many decades, in a variety of settings, including primary care. In low and middle-income countries, nurses are extensively providing care that in other settings would be provided by doctors, if the latter were available.

This summary is based on a systematic review published in 2002 by Horrocks and colleagues, and focuses on the effects of substituting nurses for doctors working in primary care; in the provision of first point of contact, initial assessment and management of patients.

How this summary was prepared

After searching widely for systematic reviews that can help inform decisions about health systems, we have selected ones that provide information that is relevant to low- and middle-income countries. The methods used to assess the quality of the review and to make judgements about its relevance are described here: www.support-collaboration.org/summaries/methods.htm

Knowing what's not known is important

A good quality review might not find any studies from low- and middle-income countries or might not find any well-designed studies. Although that is disappointing, it is important to know what is not known as well as what is known.

About the systematic review underlying this summary

Review objective: To assess the effects of doctor-nurse substitution in primary care

	What the review authors searched for	What the review authors found
Interventions	Comparisons of nurse practitioners and doctors working in a similar way as concurrent controls	11 randomised controlled trials and 23 observational studies
Participants	Unselected patients coming to either primary care facilities or emergency departments	Patients recruited in 8 general practice or unspecified primary care facilities, 2 emergency departments, and 1 paediatric clinic
Settings	Limited to Europe, North America, Australasia, Israel, South Africa, and Japan	Studies from Canada, the UK and USA
Outcomes	Patient satisfaction, health status, process of care measures, quality of care, health service costs	Patient satisfaction, health status, process measures, quality of care, costs

Date of most recent search: April 2002

Limitations: This is a good quality systematic review, which found evidence of moderate quality

Horrocks S, Anderson E, Salisbury C. Systematic review of whether nurse practitioners working in primary care can provide equivalent care to doctors. *BMJ* 2002; 324:819-23.

Summary of findings

The systematic review identified 11 randomised controlled trials and 23 observational studies. We summarised only data from the trials, given their superiority to other designs in assessing the effectiveness of healthcare interventions. However, the review authors reported that the findings of the observational studies replicated those of the randomised controlled trials for all outcomes except costs and investigations.

1) Patient outcomes and process of care

Five randomised trials reported data on patient satisfaction, seven reported on health status, and six on quality of care. A synthesis of these trials produced the following results:

- **Moderate quality evidence that patients were more satisfied with care provided by a nurse practitioner than by a doctor.**
- **Low quality evidence that there is no significant difference in patient health outcomes between nurse practitioners and doctors.**
- **Low quality evidence that quality of care is better for nurse practitioners than doctors.**

About the quality of evidence (GRADE)

⊕⊕⊕⊕

High: Further research is very unlikely to change our confidence in the estimate of effect.

⊕⊕⊕○

Moderate: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

⊕⊕○○

Low: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

⊕○○○

Very low: We are very uncertain about the estimate.

For more information, see last page

Patient outcomes and process of care			
Patients or population: Not specified Settings: Primary care in Canada, the UK and USA Intervention: Nurse practitioners Comparison: Doctors			
Outcomes	Impact	Number of participants (studies)	Quality of the evidence (GRADE)
Health status	No difference in health outcomes (but the review showed substantial heterogeneity in the patient outcomes measured by the studies)	12,558 (7 studies)	⊕⊕○○ Low
Patient satisfaction	Standardised mean difference +0.27 (+0.07 to +0.47)	3890 (5 studies)	⊕⊕⊕○ Moderate
Quality of care	Better for nurse practitioners (but there was a great deal of heterogeneity between studies in the outcomes measured).	6166 (6 studies)	⊕⊕○○ Low

p: p-value GRADE: GRADE Working Group grades of evidence (see above and last page)

2) Resource utilisation and healthcare costs

The number of identified trials that assessed resource utilisation and direct costs were five for consultation length, four for prescriptions, five for investigations, six for return consultations, two for referrals, and five for direct costs.

- **Moderate quality evidence indicates that nurse practitioners had significantly longer consultations and undertook significantly more investigations than doctors. There were no significant differences between nurse practitioners and doctors in numbers of prescriptions, return consultations or referrals.**
- **Cost data were of very low quality and inadequate for a robust economic analysis.**
- **Subsequent modelling work (Hollingshurst 2006) suggests that the relative costs of nurse practitioners and general practitioners are similar within the setting of the UK National Health Service, and concludes that skill-mix decisions should depend on the full range of roles and responsibilities rather than cost. These findings may not be applicable to other settings.**

Resource utilisation and healthcare costs			
Patients or population: Not specified Settings: Primary care in Canada, the UK and USA Intervention: Nurse practitioners Comparison: Doctors			
Outcomes	Impact	Number of participants (studies)	Quality of the evidence (GRADE)
Consultation length	Weighted mean difference +3.67 minutes (+2.05 to +5.29)	4563 (5 studies)	⊕⊕⊕○ Moderate
Prescriptions	Odds Ratio 1.02 (0.9 to 1.15)	5364 (4 studies)	⊕⊕⊕○ Moderate
Investigations	Odds Ratio 1.22 (1.02 to 1.46)	5469 (5 studies)	⊕⊕⊕○ Moderate
Return consultations	Odds Ratio 1.05 (0.87 to 1.28)	6166 (6 studies)	⊕⊕⊕○ Moderate
Referrals	Odds Ratio 0.71 (0.30 to 1.70)	2660 (2 studies)	⊕⊕⊕○ Moderate
p: p-value GRADE: GRADE Working Group grades of evidence (see above and last page)			

Relevance of the review for low- and middle-income countries

→ Findings

▷ Interpretation*

APPLICABILITY

→ The included trials were carried out in high-income countries. Moreover, the findings of the included studies were heterogeneous for nearly all of the outcomes. The review authors suggest that this may be due to the diverse ways in which nurse practitioners worked.

▷ *Although it may be possible in some settings to substitute nurse practitioners for doctors where there is an acute shortage of doctors, economic and cultural differences, working conditions, patient populations, and the types of services provided in primary care settings may limit the applicability of these findings in low and middle-income countries.*

EQUITY

→ The included trials did not provide data regarding differential effects of the interventions for disadvantaged populations.

▷ *Given the scarcity of doctors serving disadvantaged populations, using nurse practitioners has the potential to reduce inequities in access to health care, provided they are recruited, supported and retained in underserved communities. Consideration should be given to incentives and regulations that will encourage this.*

ECONOMIC CONSIDERATIONS

→ The studies included in these reviews did not provide sufficient data to determine the costs of using nurse practitioners; what, if any, savings can be achieved by substituting doctors with nurse practitioners; or the sustainability of using nurse practitioners.

→ Further studies suggest that the relative costs of nurse practitioners and general practitioners are similar within the setting of the National Health Service in the UK.

▷ *The potential for scaling up the use of nurse practitioners depends on the availability of nurses; the availability and costs of additional training for them to become nurse practitioners; as well as supportive supervision and continuing education.*

MONITORING & EVALUATION

→ Nurse practitioners can potentially help to address shortages of doctors, but the studies did not provide data on the sustainability of substituting nurse practitioners for doctors.

▷ *In light of uncertainties about the applicability and efficiency of using nurse practitioners to substitute for doctors in low and middle-income countries, their use should be pilot tested and their impacts and costs rigorously monitored and evaluated.*

*Judgements made by the authors of this summary, not necessarily those of the review authors, based on the findings of the review and consultation with researchers and policymakers in low- and middle-income countries. For additional details about how these judgements were made see:

<http://www.support-collaboration.org/summaries/methods.htm>

Additional information

Related literature

Carter AJ, Chochinov AH. A systematic review of the impact of nurse practitioners on cost, quality of care, satisfaction and wait times in the emergency department. *CJEM* 2007;9:286-95.

Hollinghurst S, Horrocks S, Anderson E, Salisbury C. Comparing the cost of nurse practitioners and GPs in primary care: modelling economic data from randomised trials. *Br J Gen Pract* 2006;56:530-5.

Laurant M, Reeves D, Hermens R, Braspenning J, Grol R, Sibbald B. Substitution of doctors by nurses in primary care. *Cochrane Database Syst Rev* 2004, Issue 4. Art. No.: CD001271. DOI: 10.1002/14651858.CD001271.pub2.

McPherson K, Kersten P, George S, Lattimer V, Breton A, Ellis B, et al. A systematic review of evidence about extended roles for allied health professionals. *J Health Serv Res Policy* 2006;11:240-47.

O'Connor TM, Hooker RS. Extending rural and remote medicine with a new type of health worker: physician assistants. *Aust J Rural Health* 2007;15:346-51.

Smetana GW, Landon BE, Bindman AB, Burstin H, Davis RB, Tjia J, Rich EC. A comparison of outcomes resulting from generalist vs specialist care for a single discrete medical condition: a systematic review and methodologic critique. *Arch Intern Med* 2007;167:10-20.

This summary was prepared by

Charles Shey Wiysonge & Mickey Chopra, South African Medical Research Council, Cape Town, South Africa

Conflict of interest

None declared. For details, see: www.support-collaboration.org/summaries/coi.htm

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Keywords

All Summaries: evidence-informed health policy, evidence-based, systematic review, health systems research, health care, low- and middle-income countries, developing countries, primary health care.

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The **South African Cochrane Centre**, the only centre of the international Cochrane Collaboration in Africa, aims to ensure that health care decision making in Africa is informed by high quality, timely and relevant research evidence. www.mrc.ac.za/cochrane/cochrane.htm

About quality of evidence (GRADE)

The quality of the evidence is a judgement about the extent to which we can be confident that the estimates of effect are correct. These judgements are made using the GRADE system, and are provided for each outcome. The judgements are based on the type of study design (randomised trials versus observational studies), the risk of bias, the consistency of the results across studies, and the precision of the overall estimate across studies. For each outcome, the quality of the evidence is rated as high, moderate, low or very low using the definitions on page 3.

For more information about GRADE:

www.support-collaboration.org/summaries/grade.htm

SUPPORT collaborators:

The **Alliance for Health Policy and Systems Research (HPSR)** is an international collaboration aiming to promote the generation and use of health policy and systems research as a means to improve the health systems of developing countries. www.who.int/alliance-hpsr

The **Cochrane Effective Practice and Organisation of Care Group (EPOC)** is a Collaborative Review Group of the Cochrane Collaboration: an international organisation that aims to help people make well informed decisions about health care by preparing, maintaining and ensuring the accessibility of systematic reviews of the effects of health care interventions.

www.epocoslo.cochrane.org

The **Evidence-Informed Policy Network (EVIPNet)** is an initiative to promote the use of health research in policymaking. Focusing on low- and middle-income countries, EVIP-Net promotes partnerships at the country level between policy-makers, researchers and civil society in order to facilitate both policy development and policy implementation through the use of the best scientific evidence available. www.evipnet.org

For more information:

www.support-collaboration.org

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