

PICO question 11: Can pharmacological management of hypertension be provided by nonphysician care providers?

|                                            | CRITERIA                                                                                                   | JUDGEMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | RESEARCH EVIDENCE/PANEL INPUT                    |                                                           |                                                           |                                                  |                                     |                                     |                          |                          |                          |                          |                     |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| VALUES                                     | <p><b>Is there important uncertainty or variability about how much people value the main outcomes?</b></p> | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 20%;">Important<br/>uncertainty<br/>or variability</td> <td style="text-align: center; width: 20%;">Possibly<br/>important<br/>uncertainty<br/>or<br/>variability</td> <td style="text-align: center; width: 20%;">Probably no<br/>important<br/>uncertainty<br/>or variability</td> <td style="text-align: center; width: 20%;">No<br/>important<br/>uncertainty<br/>or variability</td> <td style="text-align: center; width: 20%;">No known<br/>undesirable<br/>outcomes</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td colspan="5" style="text-align: center;">Detailed judgements</td> </tr> </table> | Important<br>uncertainty<br>or variability       | Possibly<br>important<br>uncertainty<br>or<br>variability | Probably no<br>important<br>uncertainty<br>or variability | No<br>important<br>uncertainty<br>or variability | No known<br>undesirable<br>outcomes | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Detailed judgements |  |  |  |  | <p>Patient perspective:</p> <ul style="list-style-type: none"> <li>In some studies in which BP was managed by nonphysicians, there was good patient satisfaction and high retention, suggesting at least willingness, if not preference, to having BP managed by nonphysicians. An example is a study in which 130 patients managed by nonphysicians and pharmacists with similar (28 mmHg) reductions and high retention in the programme &gt;80%.<sup>81</sup> Many studies have suggested safety of nonphysician prescribing and how it is associated with patient satisfaction.<sup>82</sup></li> <li>Conversely, in-depth interviews with a sample of patients in the UK explored nurse and pharmacist prescribing and demonstrated that patients had concerns about clinical governance, privacy and whether sufficient space was available to provide the service in community pharmacies. Participants had less concern about nursing.<sup>83</sup> Another study from Scotland explored patients' perspective on pharmacist prescribing and reported high patient satisfaction but 65% stated that they would prefer to consult a doctor.<sup>84</sup></li> </ul> <p>Health professionals perspective:</p> <ul style="list-style-type: none"> <li>Numerous studies have shown that nurses and pharmacists had improved job satisfaction as a benefit of prescribing, as well as evidence of safety and competency.</li> <li>Nurses have reported that prescribing is associated with increased workload, work-related stress and continuous need to update competencies, and an additional documentation burden.<sup>85</sup></li> <li>Physicians' perspective summarized in one systematic review was overall supportive but included concerns over pharmacists' lack of clinical assessment and diagnosis skills and access to patient medical records, legal concerns, a potential negative effect on the physician–patient relationship, and potential miscommunication between the members of the multidisciplinary team.<sup>86</sup></li> <li>Overall society and patients want to reduce risk of premature mortality or morbidity. Most of the available quantitative data were focused on remote monitoring and not specifically on whether patients preferred BP being managed by MDs vs other providers, which was the primary question.</li> </ul> |
| Important<br>uncertainty<br>or variability | Possibly<br>important<br>uncertainty<br>or<br>variability                                                  | Probably no<br>important<br>uncertainty<br>or variability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | No<br>important<br>uncertainty<br>or variability | No known<br>undesirable<br>outcomes                       |                                                           |                                                  |                                     |                                     |                          |                          |                          |                          |                     |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| Detailed judgements                        |                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                  |                                                           |                                                           |                                                  |                                     |                                     |                          |                          |                          |                          |                     |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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|                                   |                                                                   |                                                                                                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>Limited information provided mixed results, where some patients appreciated some applications of self-care while others were concerned that being managed by others could harm the patient–doctor relationship. but these comments were related to use of home-monitoring devices.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| BENEFITS AND HARMS OF THE OPTIONS | <b>What is the overall certainty of the evidence of effects?</b>  | No included studies    Very low    Low    Moderate    High<br><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/><br><b>Detailed judgements</b>                                | Data are available about BP managed by a pharmacist, nurse, dietitian, community HCW and about self-management (primarily self-monitoring). All of the community HCW-led intervention studies included focused on life-style education and health promotion, mainly at home or in community settings. No hard endpoints, data mainly consisted of BP control measures such as percentage controlled, adherence and mean SBP/DBP (as expected in such programmes).                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                   | <b>How substantial are the desirable anticipated effects?</b>     | Don't know    Trivial    Small    Moderate    Large    Varies<br><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/><br><b>Detailed judgements</b>    | Magnitude of effect: better control in 91 to 264 more per 1000, pharmacist, SMP/DBP reduction of 1–8 mmHg, nurse/HCW/dietitian.<br><br>Evidence is from HICs and may not apply to other settings.<br><br>The nonphysician training in some countries is quite variable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                   | <b>How substantial are the undesirable anticipated effects?</b>   | Don't know    Trivial    Small    Moderate    Large    Varies<br><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/><br><b>Detailed judgements</b>    | Although the certainty of evidence was in general low, no study showed that nonphysician management was inferior. In fact, all the data that were limited to either pharmacy, nurse or community HCW-led care was found to be either no different or improved compared to usual care (physician-led care).<br><br>Scirica et al studied 5000 patients in Boston managed remotely by navigators under pharmacist supervision. No office visits with MD. BP reduction of up to 30 mmHg. <sup>87</sup> The two studies by Scirica and Fisher are two examples of managing over 5000 patients with a non-clinical navigator supervised by a nurse and/or pharmacist and with no clinical visits – all with home BP cuffs with electronic transmission of data and no in-person visits. Prabhakar and others in India and China are conducting similar work with CHWs and show no sign of loss of safety. <sup>81 87</sup> |
|                                   | <b>Do the desirable effects outweigh the undesirable effects?</b> | No    Probably No    Don't know    Probably Yes    Yes    Varies<br><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/><br><b>Detailed judgements</b> | A systematic review by Greer et al. of pharmacy-managed care led to better BP control (RR 1.44 or 170 more controlled per 1000) with no obviously reported difference in adherence or clinical events or QOL. <sup>88</sup><br><br>A systematic review by Anand has shown that in LICs and MICs, task sharing with pharmacists led to 8 mmHg SBP and 3.74 mmHg DBP reductions. Task-sharing with nurses (5.34 mmHg lower), dieticians (4.67 mmHg lower), and CHWs (3.67 mmHg lower) yielded similar results. <sup>89</sup><br><br>A systematic review by Tucker <sup>90</sup> shows that self-monitoring by patients led to a 3.24 mmHg lower level SBP and 1.5 DBP, both statistically significant, and better BP control. Study limited by ability to adequately                                                                                                                                                    |

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|--------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                                                                              |                                                                                                                                                                                                                                                                                                                                  | blind. Effect likely real but improved when supplemented with education, counseling and telecommunication.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| RESOURCE USE | <p><b>How large are the resource requirements?</b></p>                       | <p>Large costs   Moderate costs   Small   Moderate savings   Large savings   Varies</p> <p><input type="checkbox"/>   <input type="checkbox"/>   <input type="checkbox"/>   <input type="checkbox"/>   <input type="checkbox"/>   <input checked="" type="checkbox"/></p> <p style="text-align: center;">Detailed judgements</p> | <p>Jacob et al.<sup>91 92</sup> synthesize data from 31 studies (24 in the US) and suggest studies that use community team approaches cost around USD 200/person/yr to implement but with cost-savings for prevention of negative CVD outcomes such that net costs had a median cost of USD 65/person/yr with 10 studies, with negative or cost-savings overall. Most cost/QALY estimates were between USD 3888–24 000/QALY, with pharmacist led more cost-effective than nurse led.</p> <p>Only two were &gt; USD 50 000/QALY out of 28 studies. Most of the remaining cost data presented was related to self-monitoring and not to the question of physician vs nonphysician led care. However, if it is assumed that nonphysician salaries are lower, then potentially costs will be lower, but that assumes that physicians only have limited effort involved in any oversight of nonphysicians. Kulchaitanaroi et al found similar results with physician-MD collaborative system.<sup>93</sup></p> <p>For self-monitoring or use of home BP monitoring, both training and access to inexpensive devices will need to be ensured for this to be feasible. Reimbursement and incentives must be aligned to encourage this type of care but could be effective in achieved.</p> <p>A reduction in the cost of the technology and an increase in the use of smart phones is likely to increase the use of home monitoring over time.</p> |
|              | <p><b>How large is the incremental cost relative to the net benefit?</b></p> | <p>Very large ICER   Large ICER   Moderate ICER   Small ICER   Savings   Varies</p> <p><input type="checkbox"/>   <input type="checkbox"/>   <input checked="" type="checkbox"/>   <input type="checkbox"/>   <input type="checkbox"/>   <input type="checkbox"/></p> <p style="text-align: center;">Detailed judgements</p>     | <p>The two available analyses mentioned above focused on team-based interventions as opposed to specifically physician vs other provider, and it is not clear if ICERs fit all countries, nor the willingness-to-pay thresholds was for countries analysed. All values appear to be below USD 50 000/QALY. For the US the results were highly cost-effectively, with most estimates well under USE 50 000/QALY. It is unclear exactly how these might be translated in LICs and MICs, but even at \$10 000/QALY this would be acceptable for most MICs, though perhaps not all LICs. However, if the costs of direction by nurse or pharmacists was the same, compared to physicians, then there is likely to be a cost-saving.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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|---------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EQUITY        | What would be the impact on health inequities? | <p>Increased    Probably increased    Uncertain    Probably reduced    Reduced    Varies</p> <p><input type="checkbox"/>    <input type="checkbox"/>    <input type="checkbox"/>    <input checked="" type="checkbox"/>    <input type="checkbox"/>    <input type="checkbox"/></p> <p>Detailed judgements</p> | Unclear, but presumably equity is enhanced since task-shifting in public sector increases access to those using public health vs private health. Increasing access in underserved areas can improve inequities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| ACCEPTABILITY | Is the option acceptable to key stakeholders?  | <p>No    Probably No    Uncertain    Probably Yes    Yes    Varies</p> <p><input type="checkbox"/>    <input type="checkbox"/>    <input type="checkbox"/>    <input type="checkbox"/>    <input type="checkbox"/>    <input checked="" type="checkbox"/></p> <p>Detailed judgements</p>                       | <p>Numerous studies are available about telemonitoring that included management by nonphysicians. However, the focus was on the question of telemonitoring. Response to telemonitoring appears mixed, with some finding advantages and other disadvantages.</p> <p>Walker et al. found that providing management by nonphysicians and telemonitoring can make patients concerned that their care could become more focused on clinical data rather than on personal interaction, and that this might lead to fewer face-to-face consultations with clinicians. This personal contact was important to patients as it helped to establish trust and allowed for better communication. Patients also felt being able to discuss their monitoring data made them feel empowered and a more equal partner in their care, allowing them to be “better equipped to engage with health care services”. Remote monitoring provided patients with peace of mind and reduced their anxiety and stress.<sup>94</sup></p> |
| FEASIBILITY   | Is the option feasible to implement?           | <p>No    Probably No    Uncertain    Probably Yes    Yes    Varies</p> <p><input type="checkbox"/>    <input type="checkbox"/>    <input type="checkbox"/>    <input checked="" type="checkbox"/>    <input type="checkbox"/>    <input type="checkbox"/></p> <p>Detailed judgements</p>                       | <p>A systematic review by Cheema et al. described the UK model of community pharmacies where pharmacists are able to deliver some aspects of primary care.<sup>95</sup></p> <p>The evidence is mixed, with some high-income countries having access to self-monitoring and care or assistance with pharmacists; thus suggesting feasibility in some settings.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## Recommendation 8: treatment by nonphysician professionals

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|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------|-------------------------------------|--------------------------|
| <b>Recommendation</b>                           | <b>WHO suggests that pharmacological treatment of hypertension can be provided by nonphysician professionals such as pharmacists and nurses, as long as the following conditions are met: proper training, prescribing authority, specific management protocols and physician oversight.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                            |                                                       |                                     |                          |
| <b>Type of recommendation</b>                   | We recommend against the option or for the alternative                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | We suggest not to use the option or to use the alternative | We suggest using either the option or the alternative | <b>We suggest using the option</b>  | We recommend the option  |
|                                                 | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <input type="checkbox"/>                                   | <input type="checkbox"/>                              | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <b>Justification</b>                            | All studies reviewed showed that when either a team-based approach or nurse, pharmacists, or community HCWs were evaluated, the result was either no difference or in favour over usual care with a physician alone. Increasing access to HTN care to the nearly 900 million globally who are not under control by using pharmacists or nurses and CHWs under proper supervision justifies expanding BP management to nonphysicians.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                            |                                                       |                                     |                          |
| <b>Subgroup considerations</b>                  | Studies that looked at how telemonitoring of BP could impact care suggested that in most cases patient satisfaction is high and that it led to improved adherence especially with increasing age. <sup>77 96 97</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                            |                                                       |                                     |                          |
| <b>Implementation considerations</b>            | <p>Community HCWs can assist through an established collaborative care model.</p> <p>Telemonitoring and community or home-based self-care are encouraged to enhance the control of BP as a part of an integrated management system, when deemed appropriate by the treating medical team and found feasible and affordable by patients.</p> <p>The interventions studied in the literature are multifaceted and focus on task sharing, therefore implementation should have a similar infrastructure.</p> <p>In order for nonphysicians to help with BP management, there must be legal/regulatory authority for them to either prescribe independently or under the license of a registered physician.</p> <p>Use of home-monitoring devices has extra costs and requires some level of technical proficiency (which is increasing globally), but when it occurs it can aid control of BP.<sup>87 81</sup></p> |                                                            |                                                       |                                     |                          |
| <b>Monitoring and evaluation considerations</b> | The primary question is whether nonphysicians can deliver care as effectively as physicians. However, most available data were about how telemonitoring can aid in the management of either set of providers as long as it can be done in a cost-effective way. Innovations in bluetooth and wi-fi-based home BP cuffs can enhance the care of any provider helping to managing HTN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                            |                                                       |                                     |                          |

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**Research priorities**

- Evaluation of implementing various home-based monitoring programmes with different technologies to relay data to provider, be it a physician, nurse, pharmacist or CHW.
  - Assessing in more detail which tasks specifically ought to be shifted to different providers and/or technologies, separating the tasks of screening, treatment algorithms, prescribing authority, clinical decision supports, medication availability and delivery.
-