

## Management of blood pressure in primary care

New evidence raises questions about current practice



### RESEARCH, pp 1245, 1260

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**Competing interests:** RJM has received funding for research or conference expenses from Sanofi Aventis, Pfizer, A Menarini Pharma, and MSD. JM has undertaken consultancy for Pharmaswiss. JM and RJM are investigators on an NIHR funded stroke prevention programme, which includes exploration of the potential role of a polypill for cardiovascular risk reduction in primary care.

**Provenance and peer review:** Commissioned; not externally peer reviewed.

Cite this as: *BMJ* 2009;338:b940  
doi: 10.1136/bmj.b940

Two studies provide new insights into the monitoring and control of blood pressure.<sup>1,2</sup> In recent years, emphasis has shifted away from treating hypertension as a separate entity towards treating it in the context of the risk of cardiovascular disease.<sup>3</sup> This shift has informed randomised controlled trials, such as the PROGRESS trial, which have looked for (and found) benefits of treating people at high risk (in this case, those with a previous stroke or transient ischaemic attack) with blood pressure lowering agents regardless of their blood pressure.<sup>4</sup> It has also influenced guidelines that have recommended lower blood pressure treatment targets for people at higher risk of cardiovascular events.<sup>5,6</sup> Within this new paradigm, we continue to titrate the use of antihypertensive drugs against blood pressure measurements. The two studies both provide data to challenge this orthodoxy.

Hypertension is perhaps the most common form of chronic disease managed in primary care and routine review is costly. Follow-up is recommended every six to 12 months for people with controlled blood pressure, and in the United Kingdom pay for performance remuneration requires that blood pressure has been measured within the past nine months.<sup>5,7</sup> Actual attendance seems to be even more frequent, however—a recent study found that patients receiving usual care for hypertension saw their general practitioner for such care more than four times in a year.<sup>8</sup>

Keenan and colleagues' findings suggest that much of this activity is misguided. They used data from patients in the active, two drug, treatment arm of the PROGRESS study to evaluate variability in blood pressure from three months after the patients started treatment.<sup>1</sup> Over the next 33 months they estimated long term and short term variability with the aim of differentiating true changes in blood pressure over time from random variation and measurement "noise." They found that, if someone had a blood pressure of 130 mm Hg at baseline, there was only about a 1% chance that a subsequent blood pressure reading three months later of 140 mm Hg or above was a "true" increase. This figure rose with time, but even after 21 months there was only a 50% chance that such an increase was real.

These data suggest that we need to rethink how we monitor the control of blood pressure. We could use techniques that reduce the effect of the inherent variability of blood pressure and increase the chance that an observed increase in blood pressure is a true one. For example, self monitoring allows multiple measurements to be taken over several days.<sup>9</sup> Recent European guidelines have described self monitoring schedules,

but the evidence base to support these schedules or self monitored treatment targets is not strong.<sup>10</sup> Intermittent use of self monitoring would require careful education of patients and doctors, but modern automated sphygmomanometers are simple enough to require minimal instruction. Ambulatory monitoring could be an alternative for those unable to self monitor, but it is expensive and not widely available in primary care. Alternatively, less frequent monitoring may be more appropriate and cost effective. Adverse effects of treatment rather than blood pressure control would then be the main driver of the frequency of monitoring.

Law and colleagues conducted a wide ranging meta-analysis of trials of blood pressure lowering, and their findings will contribute to debate on the management of hypertension in several areas.<sup>2</sup> For example, in contrast to other reviews, the authors conclude that  $\beta$  blockers are as effective as other blood pressure lowering agents.<sup>5,11</sup> Their finding that antihypertensive drugs have no major effects on cardiovascular risk independent of their effect on blood pressure concurs with previous analyses.<sup>12</sup> They also found that the effect of lowering blood pressure on risk of cardiovascular disease was independent of the pretreatment blood pressure; this reinforces the view that treatment to lower blood pressure should be offered on the basis of risk, regardless of blood pressure.<sup>3</sup>

Perhaps the most controversial aspect of their analysis is their comparison of combination blood pressure therapy at half standard doses with combination therapy at standard dose. For example, they conclude that patients with a systolic blood pressure of 150 mm Hg would achieve a 20 mm Hg drop in pressure if they took three drugs at half standard dose, or a 16 mm Hg drop if they took two drugs at standard dose. No trials have tested combinations of three drugs at half standard dose, and their analysis assumes that the effects are additive. Taken at face value, these findings provide tacit support for the use of a "polypill" to lower the risk of cardiovascular disease in people likely to be at high risk (such as all people over the age of 55) without first checking their blood pressure.<sup>13</sup>

If antihypertensives differ little in their efficacy, then acceptability becomes a key driver for treatment choice, along with the presence of comorbidities, such as diabetes or benign prostatic hypertrophy. Law and colleagues argue that reduced dose combination therapy is likely to reduce dose related side effects, and that patient specific factors such as comorbidity are generally of minor importance in determining antihypertensive therapy—a view that runs counter to current guidelines.<sup>5,7</sup>

Taken together, these two studies may herald a new era of blood pressure management. The place of the sphygmomanometer in the doctor's office for monitoring blood pressure lowering treatment no longer seems secure—it may perhaps be replaced by intermittent but infrequent blood pressure measurement at home supplemented by periodic enquiry about side effects as treatment choices become determined by tolerability rather than algorithm.

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## Surgical training using simulation

Early evidence is promising, but integration with existing systems is key



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**Competing interests:** None declared.

**Provenance and peer review:** Commissioned; not externally peer reviewed.

**Cite this as:** *BMJ* 2009;338:b1001  
 doi: 10.1136/bmj.b1001

Surgery was traditionally learnt by repeated practice on patients. Trainee surgeons were exposed to innumerable operative cases over many years, with supervision tailored to their needs. This provided experience in coping with a wide range of operative approaches and complications, and it balanced trainees' levels of experience with the demands of the procedure.

This process has changed radically in recent years. Minimally invasive surgical techniques have led to fast track and ambulatory surgery; service targets and reductions in working time have reduced training opportunities for young doctors; and strong ethical imperatives have made it unacceptable for novices to learn "on patients."<sup>1</sup> Traditional approaches are therefore no longer tenable. How then should surgeons learn their craft? In the linked randomised controlled trial, Larsen and colleagues assess the effect of virtual reality training on surgical performance in laparoscopic surgery.<sup>2</sup>

Simulation offers obvious benefits, especially in mastering counterintuitive techniques such as minimal access surgery. Sophisticated virtual reality simulators can provide anatomically realistic re-creations of many operations, with inbuilt metrics that enable technical performance to be recorded, measured, and used for feedback. Practice on such simulators, to a predefined level of proficiency, enables inexperienced trainees to acquire skills in a structured, educationally oriented manner without risk of harming patients.

Although simulation based training has been explored within the craft specialties since the 1970s, high quality evidence to support its widespread adoption within the curriculum is lacking.<sup>3</sup> A key question is whether skills learnt on a simulator translate to improved performance on patients.

It is here that Larsen and colleagues make an important contribution to our understanding.<sup>2</sup> In their trial of junior gynaecology registrars, an intervention group (with no clinical experience of advanced laparoscopy) was trained to proficiency on a virtual reality simulator. When the registrars performed their first laparoscopic salpingectomy on a patient (under senior supervision), the virtual reality trained group performed to the level of intermediately experienced laparoscopists (20-50 patient cases), whereas the control group performed at the novice level (less than five cases) and took twice as long to complete the procedure. The inexperienced surgeons needed to perform 28 simulated salpingectomies to attain the same level of proficiency as those in the virtual reality training group, who were given seven hours of dedicated training outside the service setting.

If simulation based practice can accelerate progress along the learning curve, it has obvious educational benefits.<sup>4,5</sup> But caution is needed when interpreting the results of this study. Firstly, the study investigated manipulative surgical skills. Although these are essential, they are only a part of a wider set of skills that are fundamental to safe practice, such as communication, decision making, judgment, and leadership.<sup>6</sup> Simulation based training that takes place outside the clinical setting risks isolating the trainee from the rest of the team and creating a misleading oversimplification of a complex reality.<sup>7</sup> Secondly, Larsen and colleagues studied routine salpingectomy in selected patients who had no complications. But a major challenge of surgery is being able to cope with the unexpected. Would simulator trained surgeons be able to deal with scenarios such as distorted anatomy, unexpected bleeding, missing equipment, a dysfunctional team, or the pressures of operating in the middle of the night? Thirdly, this study is limited to one procedure in one specialty, so