ANALYSE ET TRAITEMENT D’UNE HTA RESISTANTE

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Service d’HTA - HEGP - Paris
Blood pressure, stroke, and coronary heart disease: Part 2, short-term reductions in blood pressure: overview of randomised drug trials in their epidemiological context.

Collins R et al. The Lancet, 1990; 335: 827-838

| Nb d’études | 14 |
| Suivi (ans) | 5 |
| Nb de sujets (25 à 70 ans) | 36 908 |
| Δ PAD 5 mmHg |
| Réduction AVC | 42 % |
| Réduction Ev. Coro. | 14 % |
Effects of different BP-lowering regimens on major CV events: results of prospectively-designed overviews of randomised trials.


<table>
<thead>
<tr>
<th></th>
<th>Trials</th>
<th>1st listed</th>
<th>2nd listed</th>
<th>Difference in BP* (Mean, mm Hg)</th>
<th>Relative risk</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stroke</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACEI vs placebo</td>
<td>10,21,22,26,27</td>
<td>5</td>
<td>473/9111</td>
<td>660/9118</td>
<td>-5/-2</td>
<td>0.72 (0.64–0.81)</td>
</tr>
<tr>
<td>CA vs placebo</td>
<td>13,20,23,28</td>
<td>4</td>
<td>76/3794</td>
<td>119/3688</td>
<td>-8/-4</td>
<td>0.62 (0.47–0.82)</td>
</tr>
<tr>
<td>More vs less</td>
<td>17,24,30,31</td>
<td>4</td>
<td>140/7494</td>
<td>261/13 394</td>
<td>-4/-3</td>
<td>0.77 (0.63–0.95)</td>
</tr>
<tr>
<td><strong>Coronary heart disease</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>ACEI vs placebo</td>
<td>10,21,22,26,27</td>
<td>5</td>
<td>667/9111</td>
<td>834/9118</td>
<td>-5/-2</td>
<td>0.80 (0.73–0.88)</td>
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<tr>
<td>CA vs placebo</td>
<td>13,20,23,28</td>
<td>4</td>
<td>125/3794</td>
<td>156/3688</td>
<td>-8/-4</td>
<td>0.78 (0.62–0.99)</td>
</tr>
<tr>
<td>More vs less</td>
<td>17,24,30,31</td>
<td>4</td>
<td>274/7494</td>
<td>348/13 394</td>
<td>-4/-3</td>
<td>0.95 (0.81–1.11)</td>
</tr>
<tr>
<td><strong>Heart failure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACEI vs placebo</td>
<td>10,21,22,26,27</td>
<td>5</td>
<td>219/8233</td>
<td>269/8246</td>
<td>-5/-2</td>
<td>0.82 (0.69–0.98)</td>
</tr>
<tr>
<td>CA vs placebo</td>
<td>13,20,23,28</td>
<td>3</td>
<td>104/3382</td>
<td>88/3274</td>
<td>-8/-4</td>
<td>1.21 (0.93–1.58)</td>
</tr>
<tr>
<td>More vs less</td>
<td>20,21,35,43</td>
<td>4</td>
<td>54/7494</td>
<td>72/13 394</td>
<td>-4/-3</td>
<td>0.84 (0.59–1.18)</td>
</tr>
<tr>
<td><strong>Major cardiovascular events</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>ACEI vs placebo</td>
<td>10,21,22,26,27</td>
<td>5</td>
<td>1283/9111</td>
<td>1648/9118</td>
<td>-5/-2</td>
<td>0.78 (0.73–0.83)</td>
</tr>
<tr>
<td>CA vs placebo</td>
<td>13,20,23,28</td>
<td>3</td>
<td>280/3382</td>
<td>337/3274</td>
<td>-8/-4</td>
<td>0.82 (0.71–0.95)</td>
</tr>
<tr>
<td>More vs less</td>
<td>17,24,30,31</td>
<td>4</td>
<td>482/8034</td>
<td>719/13 948</td>
<td>-4/-3</td>
<td>0.85 (0.76–0.95)</td>
</tr>
<tr>
<td><strong>Cardiovascular death</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACEI vs placebo</td>
<td>10,21,22,26,27</td>
<td>5</td>
<td>488/9111</td>
<td>614/9118</td>
<td>-5/-2</td>
<td>0.80 (0.71–0.89)</td>
</tr>
<tr>
<td>CA vs placebo</td>
<td>13,20,23,28</td>
<td>4</td>
<td>107/3382</td>
<td>135/3274</td>
<td>-8/-4</td>
<td>0.78 (0.61–1.00)</td>
</tr>
<tr>
<td>More vs less</td>
<td>17,24,30,31</td>
<td>5</td>
<td>209/8034</td>
<td>271/13 948</td>
<td>-4/-3</td>
<td>0.93 (0.77–1.11)</td>
</tr>
<tr>
<td><strong>Total mortality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACEI vs placebo</td>
<td>10,21,22,26,27</td>
<td>5</td>
<td>839/9111</td>
<td>951/9118</td>
<td>-5/-2</td>
<td>0.88 (0.81–0.96)</td>
</tr>
<tr>
<td>CA vs placebo</td>
<td>13,20,23,28</td>
<td>4</td>
<td>239/3794</td>
<td>263/3688</td>
<td>-8/-4</td>
<td>0.89 (0.75–1.06)</td>
</tr>
<tr>
<td>More vs less</td>
<td>17,24,30,31</td>
<td>5</td>
<td>404/8034</td>
<td>549/13 948</td>
<td>-4/-3</td>
<td>0.96 (0.84–1.09)</td>
</tr>
</tbody>
</table>

*Relative risk (95% CI)*

Figure 6: Differences in BP between treatment groups with odds ratios for primary endpoint, secondary endpoints, and all-cause death during consecutive time periods in the study.

![Graphs and hazard ratio chart](image)

- **SBP**
  - Placebo: 141.6
  - Felodipine: 138.1
- **DBP**
  - Placebo: 83.9
  - Felodipine: 82.3
- **Between treatment differences**
  - SBP: 4.2 mmHg
  - DBP: 2.1 mmHg
### OBJECTIFS TENSIONNELS : RECOMMANDATIONS

<table>
<thead>
<tr>
<th></th>
<th>Général</th>
<th>Diabète</th>
<th>I. rénale</th>
</tr>
</thead>
<tbody>
<tr>
<td>JNC7, 2003</td>
<td>&lt;140/90</td>
<td>&lt;130/80</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>WHO/ISH, 2003</td>
<td>&lt;140</td>
<td>&lt;130/80</td>
<td></td>
</tr>
<tr>
<td>BHS, 2004</td>
<td>140/85</td>
<td>≤130/80</td>
<td>≤130/80</td>
</tr>
<tr>
<td>ANAES, 2005</td>
<td>&lt;140/90</td>
<td>&lt;130/80</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>ESH/ESC, 2007</td>
<td>&lt;140/90</td>
<td>&lt;130/80</td>
<td>&lt;130/80</td>
</tr>
</tbody>
</table>

* Godet-Thobie H et al. BEH 16 décembre 2008*

<table>
<thead>
<tr>
<th>Hommes</th>
<th>18-34 ans</th>
<th>35-44 ans</th>
<th>45-54 ans</th>
<th>55-64 ans</th>
<th>65-74 ans</th>
<th>18-74 ans</th>
<th>[IC95 % ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mesure dans l’année (%)</td>
<td>68,3</td>
<td>86,4</td>
<td>96,5</td>
<td>92,7</td>
<td>97,5</td>
<td>86,5</td>
<td>[83,1-89,9]</td>
</tr>
<tr>
<td>Prévalence de l’HTA (%)</td>
<td>4,0</td>
<td>19,5</td>
<td>42,6</td>
<td>62,4</td>
<td>69,9</td>
<td>34,1</td>
<td>[29,8-38,4]</td>
</tr>
<tr>
<td>HTA connue* (%)</td>
<td>21,5</td>
<td>22,9</td>
<td>40,5</td>
<td>55,2</td>
<td>59,9</td>
<td>46,9</td>
<td>[39,4-54,5]</td>
</tr>
<tr>
<td>HTA connue traitée* (%)</td>
<td>**</td>
<td>55,7</td>
<td>60,3</td>
<td>85,5</td>
<td>91,4</td>
<td>77,4</td>
<td>[67,2-87,6]</td>
</tr>
<tr>
<td>HTA traitée contrôlée* (%)</td>
<td>**</td>
<td>**</td>
<td>46,8</td>
<td>43,5</td>
<td>33,9</td>
<td>41,8</td>
<td>[32,3-51,3]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Femmes</th>
<th>18-34 ans</th>
<th>35-44 ans</th>
<th>45-54 ans</th>
<th>55-64 ans</th>
<th>65-74 ans</th>
<th>18-74 ans</th>
<th>[IC95 % ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mesure dans l’année (%)</td>
<td>87,5</td>
<td>88,1</td>
<td>89,5</td>
<td>93,6</td>
<td>95,7</td>
<td>90,2</td>
<td>[87,9-92,6]</td>
</tr>
<tr>
<td>Prévalence de l’HTA (%)</td>
<td>5,6</td>
<td>13,1</td>
<td>31,4</td>
<td>43,7</td>
<td>65,0</td>
<td>27,8</td>
<td>[24,7-30,8]</td>
</tr>
<tr>
<td>HTA connue* (%)</td>
<td>22,3</td>
<td>55,5</td>
<td>52,9</td>
<td>62,0</td>
<td>68,6</td>
<td>58,8</td>
<td>[52,4-65,2]</td>
</tr>
<tr>
<td>HTA connue traitée* (%)</td>
<td>**</td>
<td>60,8</td>
<td>78,4</td>
<td>91,5</td>
<td>94,9</td>
<td>86,6</td>
<td>[81,1-92,1]</td>
</tr>
<tr>
<td>HTA traitée contrôlée* (%)</td>
<td>**</td>
<td>**</td>
<td>64</td>
<td>59,4</td>
<td>49,6</td>
<td>58,5</td>
<td>[51,1-65,8]</td>
</tr>
</tbody>
</table>

* HTA connue= proportion d’hypertendus connus parmi les hypertendus.
  HTA connue traitée= proportion d’hypertendus traités par médicaments à action antihypertensive parmi les hypertendus connus.
  HTA traitée contrôlée= proportion d’hypertendus contrôlés parmi les hypertendus traités.
** Effectifs insuffisants.
Champ : France métropolitaine 18-74 ans.
Effects of intensive blood-pressure lowering and low-dose aspirin in patients with hypertension: principal results of the HOT randomised trial.


<table>
<thead>
<tr>
<th>DBP target group (mmHg)</th>
<th>≤ 90</th>
<th>≤ 85</th>
<th>≤ 80</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>6264</td>
<td>6264</td>
<td>6262</td>
</tr>
<tr>
<td>Baseline DBP (mmHg)</td>
<td>105.4 (3.4)</td>
<td>105.4 (3.4)</td>
<td>105.4 (3.4)</td>
</tr>
<tr>
<td>Difference DBP (mmHg)</td>
<td>20.3 (5.6)</td>
<td>22.3 (5.4)</td>
<td>24.3 (5.8)</td>
</tr>
<tr>
<td>Diuretics (step 5) (%)</td>
<td>19</td>
<td>22</td>
<td>24</td>
</tr>
<tr>
<td>final DBP &gt; 90 mmHg (%)</td>
<td>12</td>
<td>7</td>
<td>6</td>
</tr>
</tbody>
</table>
HTA RESISTANTE AU TRAITEMENT
DEFINITIONS

• 2007 ESH-ESC guidelines for the management of arterial hypertension. *J Hypertens* 2007; 25: 1105-1187. « When lifestyle measures and at least three drugs in adequate doses has failed to lower systolic and diastolic BP to goal. »

• ESH recommendations for BP measurement. *J Hypertens* 2003; 21: 821-48. « Clinical BP measurement consistently greater than 140/90 mmHg with three antihypertensive drugs... ». 

• The Seventh Report of the Joint National Committee. *JAMA* 2003; 289: 2560-72. « the failure to reach goal BP in patients who are adhering to full doses of an appropriate three-drug regimen that includes a diuretic. »

• Diagnostic et prise en charge de l’HTA essentielle de l’adulte. *ANAES* 2005. « PA restant au-dessus de la cible thérapeutique fixée (le plus souvent 140/90 mmHg) chez un patient traité par une association de 3 médicaments dont un diurétique ou parfois 2 médicaments antihypertenseurs à doses maximales ». 
HTA RESISTANTE AU TRAITEMENT
PREVALENCE

ANALYSE ET TRAITEMENT D’UNE HTA RESISTANTE 

LE MALADE
Characteristics of patients with uncontrolled patients in the United States


<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>LACK OF AWARENESS OF CONDITION</th>
<th>ACKNOWLEDGED, UNCONTROLLED HYPERTENSION†</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ODDS RATIO (95% CI)</td>
<td>P VALUE</td>
</tr>
<tr>
<td>Age ≥65 yr (vs. &lt;65 yr)</td>
<td>7.69 (5.88–9.09)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Male sex (vs. female sex)</td>
<td>1.57 (1.36–1.82)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Race or ethnic group (vs. non-Hispanic white)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>1.45 (1.18–1.79)</td>
<td>0.001</td>
</tr>
<tr>
<td>Mexican American</td>
<td>0.86 (0.66–1.13)</td>
<td>0.28</td>
</tr>
<tr>
<td>High-school graduation (vs. no high-school graduation)</td>
<td>0.87 (0.69–1.09)</td>
<td>0.21</td>
</tr>
<tr>
<td>Family income (vs. ≥$50,000/yr)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;$20,000/yr</td>
<td>1.25 (0.90–1.74)</td>
<td>0.18</td>
</tr>
<tr>
<td>$20,000–$49,999/yr</td>
<td>1.06 (0.82–1.38)</td>
<td>0.63</td>
</tr>
<tr>
<td>Has health insurance (vs. has no health insurance)</td>
<td>0.91 (0.61–1.34)</td>
<td>0.62</td>
</tr>
<tr>
<td>Has a usual source of care (vs. has no usual source of care)</td>
<td>1.12 (0.87–1.43)</td>
<td>0.38</td>
</tr>
<tr>
<td>No visits to physician in past 12 mo (vs. ≥1 visits in past 12 mo)</td>
<td>1.41 (1.14–1.75)</td>
<td>0.002</td>
</tr>
<tr>
<td>Current smoking (vs. nonsmoking)</td>
<td>0.78 (0.62–0.98)</td>
<td>0.04</td>
</tr>
</tbody>
</table>

*Data are from phases I and II (1988 to 1994) of the third National Health and Nutrition Examination Survey. CI denotes confidence interval.
†The model included a total of 10,576 persons: 8928 persons without hypertension and 1648 who had hypertension but who were unaware of their condition.
‡The model included 8816 persons: 1117 with acknowledged, untreated hypertension and 2399 with treated hypertension.
Predictors of Uncontrolled Hypertension in Ambulatory Patients.

525 hypertendus, analyse multivariée

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds of Poor Control</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55–64 y</td>
<td>1.26</td>
<td>0.71–2.24</td>
</tr>
<tr>
<td>65–74 y</td>
<td>2.50</td>
<td>1.49–4.19</td>
</tr>
<tr>
<td>≥75 y</td>
<td>2.56</td>
<td>1.45–4.52</td>
</tr>
<tr>
<td>Site**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAMC</td>
<td>0.63</td>
<td>0.40–1.01</td>
</tr>
<tr>
<td>Hospital</td>
<td>0.94</td>
<td>0.42–2.11</td>
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<tr>
<td>No. of antihypertensive drugs during the study period***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0.90</td>
<td>0.41–1.98</td>
</tr>
<tr>
<td>2</td>
<td>1.91</td>
<td>1.25–2.91</td>
</tr>
<tr>
<td>3</td>
<td>2.53</td>
<td>1.50–4.28</td>
</tr>
<tr>
<td>4 or 5</td>
<td>4.70</td>
<td>2.22–9.95</td>
</tr>
<tr>
<td>Angina</td>
<td>0.33</td>
<td>0.20–0.56</td>
</tr>
<tr>
<td>Lack of knowledge of appropriate SBP</td>
<td>1.55</td>
<td>1.09–2.20</td>
</tr>
<tr>
<td>Attributed a specific side effect to a specific antihypertensive medication</td>
<td>2.06</td>
<td>1.41–3.01</td>
</tr>
</tbody>
</table>
Major Predictors of Poor Adherence to Medication

- Presence of psychological problems, particularly depression
- Presence of cognitive impairment
- Treatment of asymptomatic disease
- Inadequate follow-up or discharge planning
- Side effects of medication
- Patient’s lack of belief in benefit of treatment
- Patient’s lack of insight into the illness
- Poor provider–patient relationship
- Presence of barriers to care or medications
- Missed appointments
- Complexity of treatment
- Cost of medication, copayment, or both
Figure 1. Adherence to Medication According to Frequency of Doses.
Vertical lines represent 1 SD on either side of the mean rate of adherence (horizontal bars). Data are from Claxton et al.7
### Electronic monitoring of patient adherence to oral antihypertensive medical treatment: a systematic review

*Christensen A et al. J Hypertens 2009; 27: 1540–1551*

#### Table 2  Studies with feedback of electronic monitoring data to patients aiming to improve adherence

<table>
<thead>
<tr>
<th>Reference</th>
<th>Participants receiving feedback (n)</th>
<th>Study length (weeks)</th>
<th>Adherence measures (%)</th>
<th>BP (mmHg)**</th>
<th>Change in BP during intervention (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baulmann et al. [30]</td>
<td>1</td>
<td>&gt;20</td>
<td>Dosing b 50, a 91; timing b 17, a 76</td>
<td>b 190/80, a 137/71</td>
<td>−53/−9</td>
</tr>
<tr>
<td>Bertholet et al. [31]</td>
<td>69</td>
<td>4-9</td>
<td>Dosing 92</td>
<td>b 159/104, a 143/92; BP normalized in 33% of patients</td>
<td>−16/−12 (P = 0.001)</td>
</tr>
<tr>
<td>Braam et al. [35]</td>
<td>30</td>
<td>24</td>
<td>Taking, cutoff 80:86</td>
<td>b 158/105, a 148/97</td>
<td>−10/−8 (&lt;0.05)</td>
</tr>
<tr>
<td>Bumier et al. [36]</td>
<td>37</td>
<td>13–22</td>
<td>Dosing &gt;90</td>
<td>b 156/106, a 145/97</td>
<td>−11/−9 (P &lt; 0.01)</td>
</tr>
<tr>
<td>Chiolero et al. [37]</td>
<td>1</td>
<td>&gt;56</td>
<td>Taking 0–90</td>
<td>b 188/102, a 136/76</td>
<td>−52/−26</td>
</tr>
<tr>
<td>Kruse et al. [49]</td>
<td>24</td>
<td>30</td>
<td>Taking 88, 2/d 88; dosing 86, 2/d 80</td>
<td>Improved compliance led to reduced BP</td>
<td>Reduced</td>
</tr>
<tr>
<td>Mengden et al. [60]</td>
<td>24</td>
<td>12</td>
<td>Taking b 91, a 100; dosing b 78, a 97</td>
<td>SBPM b 154/84, a 145/80</td>
<td>−9/−4 (P &lt; 0.01)</td>
</tr>
<tr>
<td>Santschi et al. [67]***</td>
<td>21 (34)</td>
<td>52</td>
<td>Taking 97% throughout</td>
<td>Various</td>
<td>Reduced (NS)</td>
</tr>
<tr>
<td>Wetzel et al. [76]***</td>
<td>164</td>
<td>8</td>
<td>Refill b 81, dosing a 96</td>
<td>b 169/96, a 153/86; 3.1% more patients had normalized BP in intervention group; more dose escalations in usual care group</td>
<td>−14/−10</td>
</tr>
<tr>
<td>Mean</td>
<td>46.6</td>
<td>22</td>
<td></td>
<td>Adjusted average BP reduction: −13.6/−9.7****</td>
<td></td>
</tr>
</tbody>
</table>

Compliance values are given for once-daily dosing unless stated otherwise. 2/d, twice daily; BP, blood pressure; SBPM, self blood pressure measurement; SD, standard deviation. **Values represent office BP measurements unless stated otherwise. ***Feedback was given to the treating physician; b, before intervention; a, after intervention. ****SD not available as not reported in the article.
Relation between insufficient response to antihypertensive treatment and poor compliance with treatment: a prospective case-control study


Table 2 Characteristics of 103 hypertensive patients by their responsiveness* to antihypertensive treatment. Values are numbers (percentages) unless stated otherwise

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Responsive (n=54)</th>
<th>Non-responsive (n=49)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliant with treatment†</td>
<td>46 (85)</td>
<td>40 (82)</td>
</tr>
<tr>
<td>Percentage of doses taken:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>91 (19)</td>
<td>88 (18)</td>
</tr>
<tr>
<td>Median (range)</td>
<td>98 (11-100)</td>
<td>96 (11-100)</td>
</tr>
<tr>
<td>Mean (SD) age (years)</td>
<td>65 (10.4)</td>
<td>62 (9.5)</td>
</tr>
<tr>
<td>Male to female ratio</td>
<td>0.67</td>
<td>0.72</td>
</tr>
<tr>
<td>Mean (SD) body mass index (kg/m²)</td>
<td>26.6 (4.5)</td>
<td>27.0 (3.5)</td>
</tr>
<tr>
<td>Tobacco smoker</td>
<td>10 (19)</td>
<td>9 (18)</td>
</tr>
<tr>
<td>Drink alcohol (&gt;3 units/day)‡</td>
<td>3 (6)</td>
<td>3 (6)</td>
</tr>
<tr>
<td>Family history of hypertension</td>
<td>32 (59)</td>
<td>36 (73)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>8 (15)</td>
<td>3 (6)</td>
</tr>
<tr>
<td>Hyperlipidaemia</td>
<td>19 (35)</td>
<td>13 (27)</td>
</tr>
</tbody>
</table>

*Patients responsive to treatment if 12 hour ambulatory blood pressure <135/85 mm Hg if aged ≤60 or <155/90 mm Hg if aged >60.
†Patients compliant if ≥80% of prescribed doses taken correctly.
‡1 unit defined as one standard drink.
A Systematic Review of the Effects of Home Blood Pressure Monitoring on Medication Adherence


<table>
<thead>
<tr>
<th>Study (year)</th>
<th>Duration of Intervention</th>
<th>N</th>
<th>Completed Follow-Up (%)</th>
<th>Adherence Measure</th>
<th>Statistical Improvement in Adherence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bailey et al.⁶ (1999)</td>
<td>8 wk</td>
<td>62</td>
<td>97</td>
<td>97</td>
<td>Pill count</td>
</tr>
<tr>
<td>Binstock et al.⁸ (1988)</td>
<td>1 yr</td>
<td>111</td>
<td>100</td>
<td>100</td>
<td>Self-report</td>
</tr>
<tr>
<td>Friedman et al.¹¹ (1996)</td>
<td>6 mo</td>
<td>267</td>
<td>85</td>
<td>92</td>
<td>Pill count</td>
</tr>
<tr>
<td>Haynes et al.¹³ (1976)</td>
<td>6 mo</td>
<td>38</td>
<td>100</td>
<td>95</td>
<td>Pill count</td>
</tr>
<tr>
<td>Girvin et al.¹² (2004)</td>
<td>6 mo</td>
<td>136</td>
<td>97</td>
<td>97</td>
<td>Pill count</td>
</tr>
<tr>
<td>McKenney et al.¹⁵ (1992)</td>
<td>24 wk</td>
<td>67</td>
<td>94</td>
<td>97</td>
<td>Electronic monitoring device</td>
</tr>
<tr>
<td>Mehos et al.¹⁶ (2000)</td>
<td>6 mo</td>
<td>36</td>
<td>98</td>
<td>97</td>
<td>Pharmacy records</td>
</tr>
<tr>
<td>Ogbuokiri¹⁸ (1980)</td>
<td>5 mo</td>
<td>24</td>
<td>79*</td>
<td>Pill count</td>
<td>Yes</td>
</tr>
<tr>
<td>Rudd et al.¹⁹ (2004)</td>
<td>6 mo</td>
<td>150</td>
<td>94</td>
<td>91</td>
<td>Electronic monitoring device</td>
</tr>
<tr>
<td>Vrijens and Goetghebeur²² (1997)</td>
<td>6 wk</td>
<td>628</td>
<td>n/a</td>
<td>n/a</td>
<td>Electronic monitoring device</td>
</tr>
<tr>
<td>Zarnke et al.²³ (1997)</td>
<td>8 wk</td>
<td>31</td>
<td>100</td>
<td>98</td>
<td>Self-report</td>
</tr>
</tbody>
</table>

n/a = not applicable; *lost to follow-up not differentiated among conditions

Of the 11 RCTs, six (54%) reported statistically significant improvement in medication adherence attributed to the intervention. Five of these six studies were complex interventions.
An average net weight reduction of 5.1 kg was associated with a reduction in SBP of 4.44 mm Hg (95% CI, 5.93-2.95) and in DBP of 3.57 mm Hg (95% CI, 4.88-2.25)

### Table 2. Changes in SBP and DBP in 25 RCTs of Weight Reduction and BP, Overall and in Subgroups

<table>
<thead>
<tr>
<th>Stratum</th>
<th>No. of Strata</th>
<th>Unadjusted SBP, mm Hg†</th>
<th>Adjusted SBP, mm Hg†</th>
<th>Unadjusted DBP, mm Hg†</th>
<th>Adjusted DBP, mm Hg†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>34</td>
<td>-4.44 (−5.93; −2.95)</td>
<td>-4.78 (−5.78; −3.80)</td>
<td>-3.57 (−4.58; −2.55)</td>
<td>-3.56 (−4.31; −2.81)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤45 years</td>
<td>15</td>
<td>-4.19 (−6.19; −2.20)</td>
<td>-4.74 (−6.35; −3.12)</td>
<td>-3.17 (−5.04; −1.31)</td>
<td>-3.69 (−4.96; −2.43)</td>
</tr>
<tr>
<td>&gt;45 years</td>
<td>19</td>
<td>-4.74 (−6.95; −2.52)</td>
<td>-4.80 (−6.48; −3.13)</td>
<td>-3.94 (−5.70; −2.12)</td>
<td>-3.43 (−4.63; −2.23)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;50% females</td>
<td>21</td>
<td>-4.75 (−6.54; −2.97)</td>
<td>-5.05 (−6.10; −3.99)</td>
<td>-4.84 (−5.61; −2.48)</td>
<td>-3.89 (−4.66; −3.12)</td>
</tr>
<tr>
<td>≥50% females</td>
<td>13</td>
<td>-3.74 (−6.40; −1.07)</td>
<td>-3.91 (−5.69; −2.13)</td>
<td>-2.53 (−4.82; −0.24)</td>
<td>-2.50 (−3.93; −1.08)</td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>17</td>
<td>-4.06 (−6.01; −2.16)</td>
<td>-4.46 (−5.71; −3.21)</td>
<td>-2.35 (−4.05; −0.65)</td>
<td>-2.62 (−3.83; −1.42)</td>
</tr>
<tr>
<td>Yes</td>
<td>17</td>
<td>-4.95 (−7.25; −2.64)</td>
<td>-4.73 (−6.40; −3.06)</td>
<td>-4.92 (−6.72; −3.12)</td>
<td>-4.36 (−5.72; −3.00)</td>
</tr>
<tr>
<td>Race†</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>14</td>
<td>-3.19 (−4.79; −1.59)</td>
<td>...</td>
<td>-2.50 (−3.00; −1.99)</td>
<td>...</td>
</tr>
<tr>
<td>Black</td>
<td>4</td>
<td>-4.67 (−8.66; −0.49)</td>
<td>...</td>
<td>-3.08 (−4.92; −1.23)</td>
<td>...</td>
</tr>
<tr>
<td>Asian</td>
<td>4</td>
<td>-8.77 (−11.91; −5.64)</td>
<td>...</td>
<td>-9.81 (−11.17; −8.44)</td>
<td>...</td>
</tr>
<tr>
<td>Intervention</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy restriction</td>
<td>19</td>
<td>-4.99 (−6.84; −3.02)</td>
<td>-4.33 (−5.70; −2.37)</td>
<td>-4.25 (−5.98; −2.55)</td>
<td>-2.84 (−3.80; −1.87)</td>
</tr>
<tr>
<td>Physical activity</td>
<td>8</td>
<td>-1.72 (−5.14; 1.69)</td>
<td>-4.74 (−7.60; −1.88)</td>
<td>-1.93 (−5.07; 1.22)</td>
<td>-4.65 (−6.84; −2.45)</td>
</tr>
<tr>
<td>Combined intervention</td>
<td>7</td>
<td>-5.15 (−7.78; −2.51)</td>
<td>-5.66 (−7.52; −3.81)</td>
<td>-3.12 (−5.60; −0.64)</td>
<td>-4.44 (−5.68; −2.19)</td>
</tr>
<tr>
<td>Initial BMI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;30 kg/m²</td>
<td>15</td>
<td>-4.14 (−4.95; −3.33)</td>
<td>-4.59 (−5.70; −3.49)</td>
<td>-2.61 (−3.29; −1.99)</td>
<td>-3.11 (−4.01; −2.21)</td>
</tr>
<tr>
<td>≥30 kg/m²</td>
<td>13</td>
<td>-4.09 (−4.87; −3.31)</td>
<td>-4.05 (−5.06; −3.05)</td>
<td>-2.75 (−3.39; −2.11)</td>
<td>-2.77 (−3.50; −2.04)</td>
</tr>
<tr>
<td>Weight reduction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤5 kg</td>
<td>16</td>
<td>-2.44 (−4.38; −0.49)</td>
<td>-2.70 (−4.59; −0.81)</td>
<td>-1.97 (−3.71; −0.21)</td>
<td>-2.01 (−3.47; −0.54)</td>
</tr>
<tr>
<td>&gt;5 kg</td>
<td>18</td>
<td>-6.24 (−8.06; −4.41)</td>
<td>-6.63 (−8.42; −4.82)</td>
<td>-4.97 (−6.62; −3.31)</td>
<td>-5.12 (−6.48; −3.75)</td>
</tr>
<tr>
<td>Antihypertensive drugs†</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>26</td>
<td>-3.77 (−5.33; −2.22)</td>
<td>-4.11 (−5.23; −3.00)</td>
<td>-2.97 (−4.39; −1.55)</td>
<td>-2.91 (−3.66; −2.16)</td>
</tr>
<tr>
<td>Yes</td>
<td>8</td>
<td>-7.00 (−10.02; −3.95)</td>
<td>-6.70 (−8.71; −4.69)</td>
<td>-5.49 (−8.06; −2.90)</td>
<td>-5.31 (−6.64; −3.99)</td>
</tr>
</tbody>
</table>
Association between refractory hypertension and obstructive sleep apnea


Table 2  Baseline polysomnographic data

<table>
<thead>
<tr>
<th></th>
<th>Controlled hypertension (n = 22)</th>
<th>Refractory hypertension (n = 42)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSA, n (%)</td>
<td>12 (55)</td>
<td>34 (81)</td>
<td>0.03</td>
</tr>
<tr>
<td>AHI (numbers of hours of sleep)</td>
<td>16.5 ± 2.7</td>
<td>24.9 ± 3.2</td>
<td>0.13</td>
</tr>
<tr>
<td>Mean SaO₂ (%)</td>
<td>94.1 ± 0.5</td>
<td>94.5 ± 0.3</td>
<td>0.49</td>
</tr>
<tr>
<td>Lowest SaO₂ (%)</td>
<td>83.8 ± 1.7</td>
<td>84.0 ± 1.1</td>
<td>0.91</td>
</tr>
<tr>
<td>Time in bed (min)</td>
<td>406.9 ± 8.7</td>
<td>396.1 ± 11.9</td>
<td>0.46</td>
</tr>
<tr>
<td>Sleep onset latency (min)</td>
<td>15.0 ± 2.5</td>
<td>25.4 ± 4.4</td>
<td>0.30</td>
</tr>
<tr>
<td>Total sleep time (min)</td>
<td>321.4 ± 9.5</td>
<td>281.9 ± 14.1</td>
<td>0.02</td>
</tr>
<tr>
<td>Wake after sleep onset (min)</td>
<td>70.6 ± 6.7</td>
<td>84.7 ± 8.8</td>
<td>0.51</td>
</tr>
<tr>
<td>Sleep efficiency (%)</td>
<td>79.0 ± 1.7</td>
<td>69.7 ± 3.0</td>
<td>0.01</td>
</tr>
<tr>
<td>Stages 1 and 2 sleep (min)</td>
<td>210.9 ± 8.7</td>
<td>207.3 ± 10.4</td>
<td>0.43</td>
</tr>
<tr>
<td>Slow wave sleep (min)</td>
<td>36.3 ± 5.1</td>
<td>27.6 ± 4.0</td>
<td>0.11</td>
</tr>
<tr>
<td>REM sleep (min)</td>
<td>65.2 ± 4.9</td>
<td>47.0 ± 4.5</td>
<td>0.02</td>
</tr>
<tr>
<td>Arousal index (number per hour of sleep)</td>
<td>19.2 ± 2.6</td>
<td>26.8 ± 3.3</td>
<td>0.11</td>
</tr>
</tbody>
</table>

Values are expressed as means ± SEM. AHI, apnea–hypopnea index; OSA, obstructive sleep apnea; REM, rapid eye movement; SaO₂, oxygen saturation.

Table 4  Odds of having refractory hypertension, multivariate logistic regression

<table>
<thead>
<tr>
<th>Factors</th>
<th>OR</th>
<th>95% CI</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of OSA</td>
<td>3.994</td>
<td>1.191–13.388</td>
<td>0.02</td>
</tr>
<tr>
<td>Reduced REM sleep time (min)</td>
<td>1.025</td>
<td>1.002–1.049</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Variables included in the multivariate analysis were the presence of OSA, reduced total sleep time, reduced sleep efficiency and reduced REM sleep. CI, confidence interval; OR, odds ratio; OSA, obstructive sleep apnea; REM, rapid eye movement.
ANALYSE ET TRAITEMENT D’UNE HTA RESISTANTE

LA MALADIE HYPERTENSIVE
HTA RESISTANTE AU TRAITEMENT
HTA SECONDAIRES

NEPHROPATHIE ET I. RENALE
STENOSE ARTERIELLE RENALE
HAP & HYPERCORTICISME & PHEOCHROMOCYTOME
### Lifestyle interventions to reduce raised blood pressure: a systematic review of randomised controlled trials.


<table>
<thead>
<tr>
<th>Type of intervention</th>
<th>n</th>
<th>N</th>
<th>MD</th>
<th>(95% CI)</th>
<th>I²</th>
<th>Size, P</th>
<th>MD</th>
<th>(95% CI)</th>
<th>I²</th>
<th>Size, P</th>
<th>n</th>
<th>RD</th>
<th>(95% CI)</th>
<th>I²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet</td>
<td>14</td>
<td>1389</td>
<td>−6.0</td>
<td>(−8.6 to −3.4)</td>
<td>72%</td>
<td>0.49</td>
<td>−4.8</td>
<td>(−6.9 to −2.7)</td>
<td>81%</td>
<td>0.25</td>
<td>12</td>
<td>0.04</td>
<td>(−0.02 to 0.09)</td>
<td>65%</td>
</tr>
<tr>
<td>Diet (excl. [28])</td>
<td>13</td>
<td>1256</td>
<td>−5.0</td>
<td>(−7.0 to −3.1)</td>
<td>52%</td>
<td>0.81</td>
<td>−3.7</td>
<td>(−5.1 to −2.4)</td>
<td>52%</td>
<td>0.59</td>
<td>12</td>
<td>0.04</td>
<td>(−0.02 to 0.09)</td>
<td>65%</td>
</tr>
<tr>
<td>Exercise</td>
<td>21</td>
<td>1346</td>
<td>−6.1</td>
<td>(−10.1 to −2.1)</td>
<td>87%</td>
<td>0.57</td>
<td>−3.0</td>
<td>(−4.9 to −1.1)</td>
<td>74%</td>
<td>0.45</td>
<td>17</td>
<td>0.03</td>
<td>(−0.01 to 0.08)</td>
<td>19%</td>
</tr>
<tr>
<td>Exercise (excl. [48])</td>
<td>20</td>
<td>1270</td>
<td>−4.6</td>
<td>(−7.1 to −2.0)</td>
<td>65%</td>
<td>0.13</td>
<td>−2.4</td>
<td>(−4.0 to −0.7)</td>
<td>58%</td>
<td>0.21</td>
<td>16</td>
<td>0.04</td>
<td>(−0.01 to 0.08)</td>
<td>26%</td>
</tr>
<tr>
<td>Relaxation</td>
<td>23</td>
<td>1231</td>
<td>−4.0</td>
<td>(−6.4 to −1.6)</td>
<td>62%</td>
<td>0.93</td>
<td>−3.1</td>
<td>(−4.7 to −1.5)</td>
<td>70%</td>
<td>0.68</td>
<td>12</td>
<td>0.04</td>
<td>(−0.01 to 0.09)</td>
<td>38%</td>
</tr>
<tr>
<td>Alcohol restriction</td>
<td>4</td>
<td>305</td>
<td>−3.8</td>
<td>(−6.1 to −1.4)</td>
<td>0%</td>
<td>0.71</td>
<td>−3.2</td>
<td>(−5.0 to −1.4)</td>
<td>0%</td>
<td>0.73</td>
<td>1</td>
<td>−0.09</td>
<td>(−0.25 to 0.08)</td>
<td>*</td>
</tr>
<tr>
<td>Sodium restriction</td>
<td>7</td>
<td>491</td>
<td>−4.7</td>
<td>(−7.2 to −2.2)</td>
<td>59%</td>
<td>0.21</td>
<td>−2.5</td>
<td>(−3.3 to −1.8)</td>
<td>5%</td>
<td>0.002</td>
<td>3</td>
<td>0.02</td>
<td>(−0.09 to 0.13)</td>
<td>4%</td>
</tr>
<tr>
<td>Sodium restriction (excl. [94])</td>
<td>6</td>
<td>450</td>
<td>−3.6</td>
<td>(−4.6 to −2.5)</td>
<td>0%</td>
<td>0.43</td>
<td>−2.5</td>
<td>(−3.2 to −1.7)</td>
<td>4%</td>
<td>0.008</td>
<td>3</td>
<td>0.02</td>
<td>(−0.09 to 0.13)</td>
<td>4%</td>
</tr>
<tr>
<td>Combined interventions</td>
<td>6</td>
<td>374</td>
<td>−3.5</td>
<td>(−8.8 to 2.3)</td>
<td>51%</td>
<td>0.41</td>
<td>−4.5</td>
<td>(−6.9 to −2.0)</td>
<td>53%</td>
<td>0.70</td>
<td>5</td>
<td>0.05</td>
<td>(−0.02 to 0.13)</td>
<td>12%</td>
</tr>
<tr>
<td>Calcium supplements</td>
<td>13</td>
<td>461</td>
<td>−2.5</td>
<td>(−4.4 to −0.6)</td>
<td>42%</td>
<td>0.90</td>
<td>−0.8</td>
<td>(−2.1 to 0.4)</td>
<td>48%</td>
<td>0.64</td>
<td>4</td>
<td>0.00</td>
<td>(−0.06 to 0.06)</td>
<td>0%</td>
</tr>
<tr>
<td>Magnesium supplements</td>
<td>12</td>
<td>527</td>
<td>−1.3</td>
<td>(−4.0 to 1.6)</td>
<td>62%</td>
<td>0.14</td>
<td>−2.2</td>
<td>(−3.4 to −0.9)</td>
<td>47%</td>
<td>0.78</td>
<td>8</td>
<td>0.00</td>
<td>(−0.04 to 0.03)</td>
<td>0%</td>
</tr>
<tr>
<td>Potassium supplements</td>
<td>5</td>
<td>398</td>
<td>−11.3</td>
<td>(−25.2 to 2.7)</td>
<td>98%</td>
<td>0.57</td>
<td>−5.0</td>
<td>(−12.4 to 2.4)</td>
<td>99%</td>
<td>0.23</td>
<td>3</td>
<td>−0.02</td>
<td>(−0.07 to 0.02)</td>
<td>0%</td>
</tr>
<tr>
<td>Potassium suppl. (excl. [133])</td>
<td>4</td>
<td>350</td>
<td>−3.9</td>
<td>(−8.6 to 0.8)</td>
<td>73%</td>
<td>0.96</td>
<td>−1.5</td>
<td>(−6.2 to 3.1)</td>
<td>96%</td>
<td>0.26</td>
<td>3</td>
<td>−0.02</td>
<td>(−0.07 to 0.02)</td>
<td>0%</td>
</tr>
<tr>
<td>Fish oil supplements</td>
<td>8</td>
<td>375</td>
<td>−2.3</td>
<td>(−4.3 to −0.2)</td>
<td>0%</td>
<td>0.10</td>
<td>−2.2</td>
<td>(−4.0 to −0.4)</td>
<td>34%</td>
<td>0.03</td>
<td>5</td>
<td>0.02</td>
<td>(−0.04 to 0.07)</td>
<td>28%</td>
</tr>
</tbody>
</table>

n, Number of included trials; N, number of participants assessed; MD, mean difference between treatment and control; CI, confidence interval; I², % of variation between trials not explained by sampling variation [11]; Size, P, P value for relationship between treatment effect and size of trial [12]; RD, risk difference. *, Not enough trials. *For parallel trials only.
104 resistant hypertension patients randomized to drug selection:
• based on serial hemodynamic measurements (thoracic bioimpedance) and a predefined algorithm,
• directed by a hypertension specialist,
in a 3-month intensive treatment program.

<table>
<thead>
<tr>
<th>Cardiac index</th>
<th>Systemic vascular resistance index</th>
<th>Medication choices</th>
</tr>
</thead>
</table>
| Low           | high                              | 1. Add or increase C, A or direct vasodilator  
|               |                                   | 2. Reduce B  
|               |                                   | 3. Evaluate TBI: if reduced, add or intensify D |
| high          | low                               | 1. Add B or central agonist  
|               |                                   | 2. Reduce vasodilators  
<p>|               |                                   | 3. Evaluate TBI: if reduced, add or intensify D |
| normal        | normal                            | Evaluate TBI: if reduced, add or intensify D |</p>
<table>
<thead>
<tr>
<th></th>
<th>Hemodynamic care</th>
<th>p</th>
<th>Specialist care</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, y</td>
<td>67 ± 2</td>
<td></td>
<td>64 ± 2</td>
</tr>
<tr>
<td>BMI, kg/m²</td>
<td>31.4 ± 1.0</td>
<td></td>
<td>32.7 ± 1.2</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>16 (32)</td>
<td></td>
<td>18 (33)</td>
</tr>
<tr>
<td>BP, mmHg</td>
<td>169 ± 3 / 87 ± 2</td>
<td></td>
<td>173 ± 3 / 91 ± 2</td>
</tr>
<tr>
<td>HR, bpm</td>
<td>66 ± 1</td>
<td>*</td>
<td>72 ± 2</td>
</tr>
<tr>
<td>No. of medications</td>
<td>3.6 ± 0.1</td>
<td></td>
<td>3.6 ± 0.1</td>
</tr>
<tr>
<td>DDD</td>
<td>1.1 ± 0.1</td>
<td></td>
<td>1.2 ± 0.2</td>
</tr>
<tr>
<td>renal artery stenosis</td>
<td>6 (12)</td>
<td></td>
<td>8 (15)</td>
</tr>
<tr>
<td>primary aldosteronsim</td>
<td>3 (6)</td>
<td></td>
<td>4 (7)</td>
</tr>
<tr>
<td>obstructive sleep apnea</td>
<td>9 (18)</td>
<td></td>
<td>11 (20)</td>
</tr>
</tbody>
</table>

After 3 months of treatment

|                                |                  |     |                 |
| BP, mmHg                       | 139 ± 2 / 72 ± 1 | */* | 147 ± 2 / 79    |
| No. of medications             | 3 ± 0.1          |     | 4.1 ± 0.1       |
| DDD                            | 2.1 ± 0.2        | *   | 1.4 ± 0.1       |
| Control ≤ 140/90 mmHg          | 28 (56)          | *   | 18 (33)         |
Renal Denervation as a Therapeutic Approach for Hypertension Novel Implications for an Old Concept

Schlaich MP et al. Hypertension. 2009; 54:
Catheter-based renal sympathetic denervation for resistant hypertension: a multicentre safety and proof-of-principle cohort study


Diffuse visceral non-radiating abdominal pain.
No complication in 43 of 45 pts.
One renal artery dissection.
One pseudoaneurysm at the femoral access site.

Figure 2: Change in office blood pressure (95% CI) at 1, 3, 6, 9, and 12 months
Numbers in parentheses indicate patients who had attended each predefined visit at the time of submission of this publication.
Management of Uncontrollable Hypertension With a Carotid Sinus Stimulation Device


Figure 1. A, Electrode system that is implanted on both carotid sinuses is shown. The adventia is stimulated directly. Pacing electrodes and suture pads of the electrodes are prepared to accommodate placement close to the carotid bifurcation. B, Chest roentgenogram after implantation showing the electrodes in place and the stimulator that is somewhat larger than a conventional pacemaker.

Figure 2. Dinamap blood pressure measurements of the patient during a hypertensive crisis are shown. Systolic blood pressure decreased >45 mm Hg, and diastolic blood pressure decreased 50 mm Hg. Thereafter, the device was shut off, and blood pressure increased over 4 hours. Continuation of the stimulus resulted in blood pressure decreases to the previous stimulation values. Voltage is indicated on the x axis. The stimulation was bilateral with a continuous square-wave pattern at a frequency of 100 Hz and a pulse width of 480 μs.
Effects of Chronic Baroreceptor Stimulation on the Autonomic Cardiovascular Regulation in Patients With Drug-Resistant Arterial Hypertension


Table 2. Twenty-Four-Hour HRV Time-Domain and Frequency-Domain Measures and Office BP Values in 21 Patients Before and With Chronic Electrical Baroreflex Stimulation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Stimulator Off</th>
<th>Stimulator On</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time-domain measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart rate, 1/min</td>
<td>81±11</td>
<td>76±10</td>
<td>0.001</td>
</tr>
<tr>
<td>R-R intervals, ms</td>
<td>743±182</td>
<td>616±107</td>
<td>0.002</td>
</tr>
<tr>
<td>SDNN, ms</td>
<td>86±20</td>
<td>95±23</td>
<td>0.2</td>
</tr>
<tr>
<td>SDNN index, ms</td>
<td>37±10</td>
<td>44±13</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>pNN50, %</td>
<td>1.3 (2.2)</td>
<td>2.6 (4.8)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>RMSSD, ms</td>
<td>18.6±6.7</td>
<td>24.3±9.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Frequency-domain measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HF power, ms²</td>
<td>42 (59)</td>
<td>67 (165)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>LF power, ms²</td>
<td>150 (196)</td>
<td>117 (135)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ratio LF/HF</td>
<td>2.76 (2.75)</td>
<td>2.24 (3.00)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Office BP</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic BP, mm Hg</td>
<td>184±31</td>
<td>154±23</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Diastolic BP, mm Hg</td>
<td>109±23</td>
<td>95±15</td>
<td>0.002</td>
</tr>
</tbody>
</table>

SDNN index indicates the mean of the SDNN intervals for all 5-minute segments in 4 hours. Data are mean±SD or median (mean).

Figure 1. Top, Effect of chronic electric baroreceptor stimulation on LF and HF power, reflecting significant changes in the sympathovagal activity consistent with an enhanced vagal outflow and a decreased sympathetic activity during chronic carotid baroreflex stimulation (ON) vs the control without stimulation (OFF). Bottom, Effect of chronic electric baroreceptor stimulation on office systolic (left) and diastolic (right) BPs.
A selective endothelin-receptor antagonist to reduce BP in patients with treatment-resistant hypertension.


Oedema or fluid retention occurred in 67 (27%) patients given darusentan compared with 19 (14%) given placebo. One patient in the placebo group died (sudden cardiac death), and 5 patients in the 3 darusentan dose groups combined had cardiac-related SAE.
ANALYSE ET TRAITEMENT D’UNE HTA RESISTANTE

LES MEDICAMENTS

ANTI HYPERTENSEURS

ET AUTRES
QUALITE DU TRAITEMENT

- doses
- synergie des associations
- délai de jugement
- passage hépatique et cytochrome P 450
- biodisponibilité
- relation concentration / effet (vallée / pic)
- distribution et adaptation au poids
- élimination et insuffisances hépatique et/ou rénale
- activité du SRAA et autres systèmes hormonaux
- interactions médicamenteuses / déplétion sodée
ASSOCIATIONS SYNERGIQUES

B-bloquant  ARA II  IEC

Diurétique thiazidique  Inhibiteur calcique

**Traits pleins** : effet additif sur la baisse tensionnelle
## SUBSTANCES VASOPRESSIVES

<table>
<thead>
<tr>
<th>AINS</th>
<th>Anti-VEGF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcool</td>
<td>Corticoïdes</td>
</tr>
<tr>
<td>Cocaïne</td>
<td>Erythropoïétique</td>
</tr>
<tr>
<td>Réglisse</td>
<td>Oestrogènes de synthèse</td>
</tr>
<tr>
<td>Sympathicomimétiques</td>
<td>Tacrolimus (FK-506, Prograf®)</td>
</tr>
<tr>
<td></td>
<td>Ciclosporine (Sandimmun®, Neoral®)</td>
</tr>
</tbody>
</table>
INHIBITION DE L’ACTION DES ANTI HYPERTENSEURS PAR LES AINS

Pope JE *(Arch Intern Med. 1993)*

54 études, 1324 participants (46 ans) dont 1213 hypertendus (92%)
Après ajustement sur les apports sodés, Δ PAM :
- + 3,59 mmHg / indométhacine, + 3,74 mmHg / naproxène,
- + 0,49 mmHg / piroxicam,
- - 0,16 mmHg / sulindac, - 0,83 mmHg / ibuprofène,
- - 1,76 mmHg / aspirine,
- - 2,59 mmHg / placebo.

Johnson AG *(Ann Intern Med. 1994)*

50 RCT dont 38 contre placebo et 12 comparant ≥ 2 AINS
Δ PAM : + 5,0 mmHg (95% IC : 1,2 – 8,7 mmHg)
Effet sur action des b-bloquants > action des vaso-dilatateurs et diurétiques.
Effet du piroxicam > du sulindac et de l’aspirine.
The effects of cyclooxygenase-2 inhibitors and NSAI therapy on 24-h BP in patients with hypertension, osteoarthritis, and type 2 diabetes mellitus.


<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Celecoxib (n = 136)</th>
<th>Rofecoxib (n = 138)</th>
<th>Naproxen (n = 130)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient Baseline Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, y</td>
<td>61.8</td>
<td>63.6</td>
<td>63.6</td>
</tr>
<tr>
<td>Sex, % (M/F)</td>
<td>38/62</td>
<td>41/59</td>
<td>40/60</td>
</tr>
<tr>
<td>Race, %</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>75</td>
<td>76</td>
<td>77</td>
</tr>
<tr>
<td>Black</td>
<td>15</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Weight, kg</td>
<td>90.6</td>
<td>90.9</td>
<td>92.2</td>
</tr>
<tr>
<td>24-h SBP, mm Hg</td>
<td>131.9</td>
<td>132.1</td>
<td>134.3</td>
</tr>
<tr>
<td>24-h DBP, mm Hg</td>
<td>75.8</td>
<td>76.2</td>
<td>76.0</td>
</tr>
<tr>
<td>24-h pulse pressure, mm Hg</td>
<td>56.2</td>
<td>55.9</td>
<td>53.3</td>
</tr>
<tr>
<td>Glycosylated hemoglobin, %</td>
<td>7.0</td>
<td>7.0</td>
<td>7.0</td>
</tr>
<tr>
<td>Nonfasting plasma glucose, mg/dL</td>
<td>154.2</td>
<td>138.0</td>
<td>142.0</td>
</tr>
<tr>
<td>Serum creatinine, mg/dL</td>
<td>0.86</td>
<td>0.97</td>
<td>0.87</td>
</tr>
<tr>
<td>Osteoarthritis index, %</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hip</td>
<td>16</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Knee</td>
<td>84</td>
<td>89</td>
<td>90</td>
</tr>
</tbody>
</table>

**Antihypertensive Therapies**

<table>
<thead>
<tr>
<th>Combination</th>
<th>Celecoxib (n = 114)</th>
<th>Rofecoxib (n = 109)</th>
<th>Naproxen (n = 101)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combination</td>
<td>84 (62)</td>
<td>85 (64)</td>
<td>84 (66)</td>
</tr>
<tr>
<td>ACE inhibitor</td>
<td>114 (84)</td>
<td>109 (83)</td>
<td>106 (83)</td>
</tr>
<tr>
<td>ARB</td>
<td>24 (18)</td>
<td>24 (18)</td>
<td>19 (15)</td>
</tr>
<tr>
<td>Calcium channel blocker</td>
<td>38 (28)</td>
<td>40 (30)</td>
<td>39 (30)</td>
</tr>
<tr>
<td>β-blocker</td>
<td>24 (18)</td>
<td>30 (23)</td>
<td>28 (22)</td>
</tr>
<tr>
<td>Diuretic</td>
<td>55 (40)</td>
<td>54 (41)</td>
<td>52 (41)</td>
</tr>
<tr>
<td>Other</td>
<td>17 (13)</td>
<td>13 (10)</td>
<td>7 (6)</td>
</tr>
</tbody>
</table>

Figure 1. Distribution of changes from baseline in ambulatory systolic blood pressure (SBP) at week 8. Fewer rofecoxib-treated patients had changes in ambulatory SBP of less than 0 mm Hg than celecoxib- or naproxen-treated patients. The percentage of rofecoxib-treated patients with elevations in ambulatory SBP across the distribution of increasing BP levels was consistently greater than for either celecoxib- or naproxen-treated patients.

Figure 2. Percentage of baseline normotensive patients who became hypertensive at week 3. Normotensive is defined as an ambulatory systolic blood pressure (SBP) lower than 135 mm Hg. Hypertensive is defined as an ambulatory SBP of 135 mm Hg or higher. P-values are based on a χ² test. Nearly twice as many patients in the rofecoxib treatment group became hypertensive compared with the celecoxib and naproxen treatment groups.
### Lifestyle interventions to reduce raised blood pressure: a systematic review of randomised controlled trials.

<table>
<thead>
<tr>
<th>Type of intervention</th>
<th>n</th>
<th>N</th>
<th>MD</th>
<th>(95% CI)</th>
<th>χ²</th>
<th>Size, P</th>
<th>MD</th>
<th>(95% CI)</th>
<th>χ²</th>
<th>Size, P</th>
<th>n</th>
<th>RD</th>
<th>(95% CI)</th>
<th>χ²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet</td>
<td>14</td>
<td>1389</td>
<td>-6.0</td>
<td>(-8.6 to -3.4)</td>
<td>72%</td>
<td>0.49</td>
<td>-4.8</td>
<td>(-6.9 to -2.7)</td>
<td>81%</td>
<td>0.25</td>
<td>12</td>
<td>0.04</td>
<td>(-0.02 to 0.09)</td>
<td>65%</td>
</tr>
<tr>
<td>Diet (excl. [28])</td>
<td>13</td>
<td>1256</td>
<td>-5.0</td>
<td>(-7.0 to -3.1)</td>
<td>52%</td>
<td>0.81</td>
<td>-3.7</td>
<td>(-5.1 to -2.4)</td>
<td>52%</td>
<td>0.59</td>
<td>12</td>
<td>0.04</td>
<td>(-0.02 to 0.09)</td>
<td>65%</td>
</tr>
<tr>
<td>Exercise</td>
<td>21</td>
<td>1346</td>
<td>-6.1</td>
<td>(-10.1 to -2.1)</td>
<td>87%</td>
<td>0.57</td>
<td>-3.0</td>
<td>(-4.9 to -1.1)</td>
<td>74%</td>
<td>0.45</td>
<td>17</td>
<td>0.03</td>
<td>(-0.01 to 0.08)</td>
<td>19%</td>
</tr>
<tr>
<td>Exercise (excl. [48])</td>
<td>20</td>
<td>1270</td>
<td>-4.6</td>
<td>(-7.1 to -2.0)</td>
<td>65%</td>
<td>0.13</td>
<td>-2.4</td>
<td>(-4.0 to -0.7)</td>
<td>58%</td>
<td>0.21</td>
<td>16</td>
<td>0.04</td>
<td>(-0.01 to 0.08)</td>
<td>26%</td>
</tr>
<tr>
<td>Relaxation</td>
<td>23</td>
<td>1231</td>
<td>-4.0</td>
<td>(-6.4 to -1.6)</td>
<td>62%</td>
<td>0.93</td>
<td>-3.1</td>
<td>(-4.7 to -1.5)</td>
<td>70%</td>
<td>0.68</td>
<td>12</td>
<td>0.04</td>
<td>(-0.01 to 0.09)</td>
<td>38%</td>
</tr>
<tr>
<td>Alcohol restriction</td>
<td>4</td>
<td>305</td>
<td>-3.8</td>
<td>(-6.1 to -1.4)</td>
<td>0%</td>
<td>0.71</td>
<td>-3.2</td>
<td>(-5.0 to -1.4)</td>
<td>0%</td>
<td>0.73</td>
<td>1</td>
<td>-0.09</td>
<td>(-0.25 to 0.08)</td>
<td>*</td>
</tr>
<tr>
<td>Sodium restriction</td>
<td>7</td>
<td>491</td>
<td>-4.7</td>
<td>(-7.2 to -2.2)</td>
<td>59%</td>
<td>0.21</td>
<td>-2.5</td>
<td>(-3.3 to -1.8)</td>
<td>5%</td>
<td>0.002</td>
<td>3</td>
<td>0.02</td>
<td>(-0.09 to 0.13)</td>
<td>4%</td>
</tr>
<tr>
<td>Sodium restriction (excl. [94])</td>
<td>6</td>
<td>450</td>
<td>-3.6</td>
<td>(-4.6 to -2.5)</td>
<td>0%</td>
<td>0.43</td>
<td>-2.5</td>
<td>(-3.2 to -1.7)</td>
<td>4%</td>
<td>0.008</td>
<td>3</td>
<td>0.02</td>
<td>(-0.09 to 0.13)</td>
<td>4%</td>
</tr>
<tr>
<td>Combined interventions</td>
<td>6</td>
<td>374</td>
<td>-5.5</td>
<td>(-8.8 to -2.3)</td>
<td>51%</td>
<td>0.41</td>
<td>-4.5</td>
<td>(-6.9 to -2.0)</td>
<td>53%</td>
<td>0.70</td>
<td>5</td>
<td>0.05</td>
<td>(-0.02 to 0.13)</td>
<td>12%</td>
</tr>
<tr>
<td>Calcium supplements</td>
<td>13</td>
<td>461</td>
<td>-2.5</td>
<td>(-4.4 to -0.6)</td>
<td>42%</td>
<td>0.90</td>
<td>-0.8</td>
<td>(-2.1 to 0.4)</td>
<td>48%</td>
<td>0.64</td>
<td>4</td>
<td>0.00</td>
<td>(-0.06 to 0.06)</td>
<td>0%</td>
</tr>
<tr>
<td>Magnesium supplements</td>
<td>12</td>
<td>527</td>
<td>-1.3</td>
<td>(-4.0 to 1.6)</td>
<td>62%</td>
<td>0.14</td>
<td>-2.2</td>
<td>(-3.4 to -0.9)</td>
<td>47%</td>
<td>0.78</td>
<td>8</td>
<td>0.00</td>
<td>(-0.04 to 0.03)</td>
<td>0%</td>
</tr>
<tr>
<td>Potassium supplements</td>
<td>5</td>
<td>398</td>
<td>-11.3</td>
<td>(-25.2 to 2.7)</td>
<td>98%</td>
<td>0.57</td>
<td>-5.0</td>
<td>(-12.4 to 2.4)</td>
<td>99%</td>
<td>0.23</td>
<td>3</td>
<td>-0.02</td>
<td>(-0.07 to 0.02)</td>
<td>0%</td>
</tr>
<tr>
<td>Potassium suppl. (excl. [133])</td>
<td>4</td>
<td>350</td>
<td>-3.9</td>
<td>(-8.6 to 0.8)</td>
<td>73%</td>
<td>0.96</td>
<td>-1.5</td>
<td>(-6.2 to 3.1)</td>
<td>96%</td>
<td>0.26</td>
<td>3</td>
<td>-0.02</td>
<td>(-0.07 to 0.02)</td>
<td>0%</td>
</tr>
<tr>
<td>Fish oil supplements</td>
<td>8</td>
<td>375</td>
<td>-2.3</td>
<td>(-4.3 to -0.2)</td>
<td>0%</td>
<td>0.10</td>
<td>-2.2</td>
<td>(-4.0 to -0.4)</td>
<td>34%</td>
<td>0.03</td>
<td>5</td>
<td>0.02</td>
<td>(-0.04 to 0.07)</td>
<td>28%</td>
</tr>
</tbody>
</table>

n, Number of included trials; N, number of participants assessed; MD, mean difference between treatment and control; CI, confidence interval; χ², % of variation between trials not explained by sampling variation [11]; Size, P, P value for relationship between treatment effect and size of trial [12]; RD, risk difference. * Not enough trials. For parallel trials only.
Home Blood-Pressure Monitoring in Patients Receiving Sunitinib.


Figure 1. Changes in Systolic and Diastolic Blood Pressure and Heart Rate.

The graphs show the changes in mean blood pressure and heart rate as measured by teletransmitted results of home monitoring in patients with metastatic renal-cell carcinoma who were treated with two cycles of sunitinib at a dose of 50 mg daily for 4 weeks (shaded area), followed by 2 weeks without treatment. The results are shown separately for patients who were normotensive (Panel A) and those who were hypertensive (Panel B) before starting sunitinib treatment. In the graphs of home blood-pressure monitoring, the dotted line shows the blood-pressure threshold for the diagnosis of hypertension (systolic pressure, >135 mm Hg, or diastolic pressure, >85 mm Hg).

For changes in heart rate, the dotted line represents the baseline value. The bars indicate the standard deviation.
ANALYSE ET TRAITEMENT D’UNE HTA RESISTANTE

LE MEDECIN
Inadequate management of blood pressure in a hypertensive population.
Berlowitz DR et al. NEJM 1998; 339: 1957-1963

800 hommes hypertendus, 66 ans, suivis 2 ans

<table>
<thead>
<tr>
<th></th>
<th>basal</th>
<th>final</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA (mmHg)</td>
<td>146/84</td>
<td>145/82</td>
<td>NS/&lt;0,001</td>
</tr>
<tr>
<td>patients PA ≥ 160/90 mmHg (%)</td>
<td>46</td>
<td>39</td>
<td>0,001</td>
</tr>
<tr>
<td>augmentation traitement (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>si PA ≥ 155/90</td>
<td></td>
<td></td>
<td>26</td>
</tr>
<tr>
<td>si PA ≥ 165 (&lt;90)</td>
<td></td>
<td></td>
<td>22</td>
</tr>
</tbody>
</table>
Comparison of hypertension management after stroke and MI. Results from ECLAT1 – a french national wide study.


<table>
<thead>
<tr>
<th>Enquête 7 décembre 2000</th>
<th>4 346 patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 009 généralistes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>IDM</th>
<th>AVC</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>846</td>
<td>570</td>
<td></td>
</tr>
<tr>
<td>PA ≥ 140/90 mmHg (%)</td>
<td>66</td>
<td>75</td>
<td>&lt;0,001</td>
</tr>
<tr>
<td>PAS (mmHg)</td>
<td>141±14</td>
<td>144±15</td>
<td>&lt;0,0001</td>
</tr>
<tr>
<td>PAD (mmHg)</td>
<td>81±8</td>
<td>82±9</td>
<td>&lt;0,05</td>
</tr>
<tr>
<td>Monothérapie (%)</td>
<td>31,4</td>
<td>43,2</td>
<td>&lt;0,0001</td>
</tr>
<tr>
<td>Trithérapie dont diurétique (%)</td>
<td>20</td>
<td>16</td>
<td>&lt;0,05</td>
</tr>
</tbody>
</table>
Figure 2. Cross-national differences in hypertension control (defined as a latest systolic blood pressure level of <140 mm Hg and a diastolic blood pressure level of <90 mm Hg) and medication increase for those with inadequately controlled hypertension.
Why Don't Physicians Follow Clinical Practice Guidelines?: A Framework for Improvement
Cabana MD et al. JAMA. 1999; 282:1458-1465

Connaissance
- Manque de familiarisation
  - Volume d’information
  - Temps nécessaire à se maintenir informé
  - Accessibilité aux recommandations

- Désaccord avec recommandations spécifiques
  - Interprétation des preuves
  - Applicabilité au patient
  - Pas de bénéfice (coût)
  - Manque de confiance dans l’organisme émetteur

- Désaccord avec les recommandations en général
  - « Recettes de cuisine »
  - Trop strictes pour être appliquées
  - Biais
  - Atteinte à l’indépendance
  - Peu pratiques

Attitudes
- Sous estimation du bénéfice
  - Le médecin ne croit pas que l’application des recommandations améliorera le résultat

- Manque de confiance en soi
  - Le médecin croit qu’il n’arrivera pas à appliquer les recommandations

- Manque de motivation / Inertie liée aux pratiques antérieures
  - Habitude
  - Routine

Comportement
- Barrières externes
  - Liées au patient
    - Impossibilité de faire correspondre les préférences du patient aux recommandations

  - Liées aux recommandations
    - Caractéristiques des recommandations
    - Existence de recommandations contradictoires

  - Facteurs environnementaux
    - Manque de temps
    - Manque de ressources
    - Contraintes organisationnelles
    - Absence de remboursement
    - Perception accrue d’incompétence
Why Don’t Physicians Follow Clinical Practice Guidelines?: A Framework for Improvement
Cabana MD et al. JAMA. 1999; 282:1458-1465
• 5 145 patients avec diagnostic d’HTA (CIM 9) en 6 mois
• 314 patients non contrôlés dont 231 interviews téléphoniques :
  69 ans ; 50% blancs; 152/84 mmHg ; 94% traités.
• 21/ 26 (81%) médecins ont répondu au questionnaire et donné informations sur 270 visites patients (taux de réponse : 86%).
  Connaissance du JNC VI (%) 52
  En accord avec JNC VI (%) 76
  Appliquent JNC VI (toujours ou habituellement) (%) 76

• Motifs de non augmentation (%)
  Poursuivre mesures PA avant changement traitement 35
  Satisfait de la réponse tensionnelle 30
  Motif de la visite indépendant de l’HTA 29
  PAD satisfaisante 16
  HTA limite 10

• Analyse multivariée (OR)
  Augmentation de TTT dans les 6 mois précédents 2.88 (1.42-5.96)
  Niveau tensionnel obtenu 2.96 (1.53-5.83)
Examination of a database derived from electronic medical records collected during routine care of a cohort of primary care: 15,459 patients with uncontrolled hypertension who made 70,557 visits to 200 clinicians (01/2004 – 12/2006).
The role of clinical uncertainty in treatment decisions for diabetic patients with uncontrolled blood pressure.


1169 diabetic patients (2005-2006).

Despite an average SBP of 154 mmHg, only 49% of patients had a change in a BP treatment (medication intensification or planned follow-up within 4 weeks).

Factors of intensification

<table>
<thead>
<tr>
<th></th>
<th>13%</th>
<th>61%</th>
<th>&lt;0.001</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBP &lt; 140/90 vs. ≥ 140/90 mmHg or no OBP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HBPM &lt; 140/90 vs. ≥ 140/90 mmHg or no HBPM</td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>OSBP goal &gt; 130 mmHg vs &lt; 130 mmHg</td>
<td></td>
<td></td>
<td>0.008</td>
</tr>
<tr>
<td>Discussion of medication issues vs no</td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
HTRés : PA restant au-dessus de la cible thérapeutique fixée (le plus souvent 140/90 mmHg) malgré une association de 3 médicaments dont un diurétique ou parfois 2 médicaments antihypertenseurs à doses maximales.

Permanence de l’HTA ?
MAPA d ou AMT > 135 et/ou 85 mmHg

Obstacles à efficacité du traitement ?
- Effets IIaires et non observance
- TTT insuffisant (type & dose diurétique / DFG)
- Agent presseur
- Apports sodés excessifs
- Agents antagonistes

Non

Oui

• Inadéquation brassard
• HTA de consultation

Oui

Adresser à service spécialisé

HTA IIaire ?
Compléter enquête étiologique

Oui

Non

Informar

Intensifier le traitement
Renforcer la déplétion sodée

Oui

Informar

Adapter le traitement