Question 27 – Cardiology
Which one of the following dietary regimens leads to the greatest reduction in systolic and diastolic blood pressure?

A. Vitamin E supplementation
B. Low salt (< 400mg/day) diet
C. Vitamin C supplementation
D. Potassium rich (> 60mg/day)
E. Low fat diet, rich in fruit and vegetables

Answer: E

- Hypertension (esp systolic hypertension and night time hypertension) has been shown to ↑ cardiovascular risk
- Interventions
  - *Lifestyle modifications is always 1st line*
  - 5 classes of anti-hypertensives: thiazides, ACEi, beta-blockers, calcium channel blockers and ARBs (any of these are reasonable for initiation of therapy)
  - Target other cardiac risk factors
- Blood pressure goals are determined by the individuals “Absolute Cardiovascular Risk” (Risk Calculator available from National Heart Foundation website)
- Role of ambulatory BP: up to 30% have “white coat HT”, also higher risk of day time and night time BP differ < 10mmHg

Table 3: Definitions and classification of blood pressure levels (mm Hg)

<table>
<thead>
<tr>
<th>Category</th>
<th>Systolic</th>
<th>Diastolic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;120</td>
<td>&lt;80</td>
</tr>
<tr>
<td>High-normal</td>
<td>120-139</td>
<td>80-89</td>
</tr>
<tr>
<td>Grade 1 (mild)</td>
<td>140-159</td>
<td>90-99</td>
</tr>
<tr>
<td>Grade 2 (moderate)</td>
<td>160-170</td>
<td>100-100</td>
</tr>
<tr>
<td>Grade 3 (severe)</td>
<td>≥ 180</td>
<td>≥110</td>
</tr>
<tr>
<td>Isolated systolic hypertension</td>
<td>≥ 140</td>
<td>&lt;90</td>
</tr>
</tbody>
</table>

When a patient’s systolic and diastolic blood pressures fall into different categories, the higher category should apply.

Table 4: Guide to follow-up of adults 18 years and over

<table>
<thead>
<tr>
<th>Systolic (mm Hg)</th>
<th>Diastolic (mm Hg)</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 120</td>
<td>&lt; 80</td>
<td>Recheck in 2 years</td>
</tr>
<tr>
<td>120-139</td>
<td>80-89</td>
<td>Recheck in 1 year – lifestyle advice</td>
</tr>
<tr>
<td>140-159</td>
<td>90-99</td>
<td>*Confirm within 2 months – lifestyle advice</td>
</tr>
<tr>
<td>160-179</td>
<td>100-109</td>
<td>*Evaluate or refer within 1 month – lifestyle advice</td>
</tr>
<tr>
<td>≥ 180</td>
<td>≥110</td>
<td>*Further evaluate and refer within 1 week (or immediately depending on clinical situation)</td>
</tr>
</tbody>
</table>

If blood pressure has been confirmed at ≥140mm Hg systolic and/or ≥110 diastolic mm Hg after multiple readings and excluding “white coat” hypertenion), drug treatment should be commenced.

Footnotes:
- Mild to moderate categories: follow same medical advice for follow-up as BP 110/75 mmHg or <110 mmHg within 1 month.
- Note: medication or dih therapy may be indicated for some patients. See page 10.
Many trials on lifestyle modifications, those that work are:
1) Low sodium diet (<90mmol/day or "no added salt" policy)
2) Low fat diet, high in fruit and vegetables
3) Weight loss
4) ETOH reduction
5) Regular aerobic exercise (30min 5x/week, recent meta-analysis showed that reduced BP by 4/2.5 mmHg)
6) Potassium supplements (meta-analysis of 27 trials showed BP reduction of 3.5/2.5 mmHg in those with low K diet ie <40mg/day, but no effect in sodium restricted patients)

Dodgy purported useful interventions
7) High dose fish oil (no conclusions yet but bleeding risk with high doses)
8) Calcium supplements (trials from 1970s! Marginal benefit, mostly in those with low calcium levels)
9) Vitamin C (only found one trial in Gerontology 1994; 40(5) 268-72. Double blinded study with Vit C supplementation in elderly with HT: no statistical difference
10) Vitamin E mostly studied for anti-oxidant effect in lipid lowering and anti-atherosclerosis

Notable trials:
TOMHS (Treatment of Mild Hypertension Study)
- Weight reduction/ low salt/ low fat/ low ETOH + one antihypertensive or placebo
- On placebo had less and less sustained BP drop over time but managed 8.6/8.6 mmHg reduction overall

DASH (Dietary Approaches to Stop Hypertension)
- 3 groups: (L) low in fruit and veges, (H) high in fruit and veges, DASH diet (high fruit and veges + low fat)
- DASH diet reduction 5.5/3 mmHg vs (H) reduction 2.8/1.1 mmHg
- Effects most pronounced in hypertensives (compared normotensives) for DASH 11.4/5.5 mmHg

Spin off trial DASH-Sodium
- DASH diet + sodium content of 3 differing concentrations
- Independent of sodium diet, DASH reduces BP significantly in hypertensives
- Greatest difference between high vs low sodium groups, with overall reduction of 8.9/4.5 mmHg
- Benefit extends to normotensives, but greatest in hypertensives and blacks

Further spin off DASH-Na: PREMIER
- Dash-Na + behavioural modification + advice sessions
- No significant difference