

**PRACTICAL POINTERS**  
**FOR**  
**PRIMARY CARE MEDICINE**  
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**FEBRUARY 2009**

**HIGHER VITAMIN D LEVELS PROTECT AGAINST COLDS [2-1]**

**WHICH DIET RESULTS IN THE GREATEST WEIGHT LOSS? [2-2]**

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This document is divided into two parts

1) The **HIGHLIGHTS AND EDITORIAL COMMENTS SECTION**

**HIGHLIGHTS** condenses the contents of studies, and allows a quick review of pertinent points of each article.

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***EDITORIAL COMMENTS** are the editor's assessments of the clinical practicality of articles based on his long-term review of the current literature and his 20-year publication of *Practical Pointers*.*

2) The main **ABSTRACTS** section is designed as a reference. It presents structured summaries of the contents of articles in much more detail.

I hope you will find *Practical Pointers* interesting and helpful. The complete content of all issues for the past 6 years can be accessed at [www.practicalpointers.org](http://www.practicalpointers.org)

Richard T. James Jr. M.D.  
Editor/Publisher.

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## HIGHLIGHTS AND EDITORIAL COMMENTS FEBRUARY 2009

### 2-1 ASSOCIATION BETWEEN SERUM 25-HYDROXYVITAMIN D LEVEL AND UPPER RESPIRATORY TRACT INFECTION: The Third National Health and Nutrition Examination Survey

Prevention of colds/influenza and “immune boosting” remain the top reasons that Americans take vitamins and herbal supplements.

For decades, vitamin C has been marketed and used for prevention and treatment. Convincing evidence of efficacy in community populations is lacking.

The importance of vitamin D in general health has expanded far beyond rickets. It is involved in the regulation of 1000 human genes. It seems to have promise in the prevention of infection, including upper respiratory tract infections. (URTI)

Vitamin D plays an important role in innate immunity.

Respiratory tract infections have been strongly linked epidemiologically with rickets. Although 25[OH]D serum levels of 10 ng/mL prevent rickets, at least 30 ng/dL are advantageous for good health. Approximately 40 ng/mL is considered optimal.

This study examined the association between serum 25[OH]D levels and URTI in a large cross sectional sample representative of the entire US population. The hypothesis was that URTI are inversely related to 25[OH]D levels.

The Third National Health and Nutrition Examination Survey was conducted in 1988-1994. This secondary analysis examined the association between 25[OH]D and recent URTI in over 18 000 participants over age 12. All had serum levels of 25[OH]D determined. at baseline.

Participants were asked if they had a cold or cough in the past few days.

#### RESULTS

Serum 25[OH]D	Number	%	Recent URI (%)
< 10	684	2	24
10-<30	12 302	53	20
30 and above	5897	45`	17

Participants with levels < 10 had 55% higher odds of a recent URTI, and those with levels 10-30 had 27% higher odds of a recent UTI compared with those whose level was 30 and above.

“The association seems to be robust, with a clinically and statistically significant association present in all seasons, and when controlled for potential confounders.” The association seemed to be stronger in individuals with asthma and COPD.

Current recommendations for D supplementation (200-600 IU daily) are unlikely to achieve optimal

serum levels. Supplementation with 1000 IU or more daily, particularly in the winter at higher latitudes, may be required.

Conclusion: Serum 25[OH]D levels had an independent inverse association with recent URTI.

Adequate supplementation may reduce incidence of URTIs.

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*I would not be surprised to read about a beneficial effect of vitamin D on incidence of pneumonia.*

*Administration to patients with asthma and COPD may be especially beneficial.*

*The Vitamin D story has been astounding. Diverse conditions related to deficiency, and improved by supplementation seem to be reported each month. How many of these will remain in the next 5 years?*

*Primary care clinicians now frequently order serum levels and prescribe high doses for those who are deficient. Administration to patients with asthma and COPD may be especially beneficial.*

*The association of vitamin C with URTI was debated for years without a firm conclusion. It is ironic that the real association was just next door.*

*Most over-the-counter and prescription vitamin D preparations are in the form of D3, which unit for unit raises serum levels much higher than D2.*

*Fortunately, vitamin D3 is available without a prescription. Its benefit/harm-cost ratio must be one of the highest for any drug. I would take at least 1000 IU daily.*

***Behavioral Factors Rather Than Macronutrient Metabolism is The Main Influence on Weight Loss.***

## **2-2 COMPARISON OF WEIGHT-LOSS DIETS WITH DIFFERENT COMPOSITIONS OF FAT, PROTEIN, AND CARBOHYDRATES**

A crucial question is whether overweight people have a better response in the long-term to diets that emphasize a specific macronutrient composition—protein, fat, or carbohydrate.

Debate has been intense. Studies reach varying conclusions. Few studies extend beyond one year.

The authors of this study recognized the need for a large trial designed to overcome the limitations of previous trials, which would compare the effects of three principal dietary macronutrients. The trial lasted 2 years because weight loss typically is greatest 6 to 12 months after initiation, with steady regain in weight subsequently.

This randomized clinical trial assigned over 800 overweight and obese adults (mean age 50; BMI 33; about 2/3 female) to different diets and compared the effects on body weight of energy-reduced diets that differed in their targets for intake of macronutrients.

Randomly assigned to:	Total fat (%)	Protein (%)	Carbohydrate (%)
1) Low-fat, average-protein	20	15	65

2) Low-fat, high-protein	20	25	55
3) High-fat, average-protein	40	15	45 ( <i>Close to a usual diet</i> )
4) High-fat, high-protein	40	25	35

Group training sessions were held frequently. Daily meal plans were provided.

The goal for physical activity was 90 min of moderate exercise weekly.

Primary outcome = change in body weight over 2 years.

At 6 months, participants who completed the study had a mean weight loss of 6.5 kg. This corresponds to a reduction in daily energy intake of approximately 225 kcal. (The goal was a reduction of 750 kcal.)

After 12 months, participants began to regain weight.

Weight loss (kg) at 2 years:

	As originally assigned (n = 811)*	Completers at 2 years (n = 645; 80%)
15% protein	3.0	3.6
25% protein	3.6	4.5
20% fat	3.3	4.1
40% fat	3.3	3.9
65% carbohydrate	2.9	3.4
35% carbohydrate	3.4	4.0

(\**Intention-to-treat*)

Differences between groups were not statistically significant.

Satiety, hunger, satisfaction with the diet, and attendance at group meetings were similar between diets.

At 2 years, waist circumference decreased by about 4 cm, with no statistically significant differences between groups.

The diets improved lipids and fasting insulin levels.

Attendance at group sessions strongly predicted weight loss.

“The findings should be directly applicable to both clinicians’ recommendations for weight loss in individual patients and the development of population-wide recommendations by public health officials”

Participants assigned to a high-fat average-protein diet [*diet 3) above*] did not have to change their diet very much and could focus more on reducing caloric intake.

“We view attendance at counseling sessions as a proxy for commitment to achieving weight loss

and for engagement in the program.” High attendees lost more weight and were less likely to regain after one year. Continued contact is essential.

“These findings point to behavioral factors rather than macronutrient metabolism as the main influences on weight loss.” Any type of diet, when taught for the purpose of weight loss with enthusiasm and persistence, can be effective. The specific macronutrient content is of minor importance. “Calories do count.”

Conclusion: Diets that are successful in causing weight loss can emphasize a range of fat, protein, and carbohydrate compositions that have beneficial effects. Such diets can be tailored to individual patients on the basis of their personal and cultural preferences and may have the best chance for long-term success.

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*I congratulate the investigators on a study of importance to primary care. I hope the study will continue for another 5 to 10 years.*

*Overall, weight loss was disappointing, although there were a few outliers who lost a clinically significant amount of weight. Mean BMI declined from 33 to 31. Patients were still obese.*

*Primary care clinicians and their patients would rarely achieve even these limited results.*

*There were, however, occasional outliers who lost clinically significant weight.*

*We need a completely new societal approach to prevention of weight gain and to weight loss. What we have tried does not work. This would require a life-long population-based shift of dietary habits and exercise. This will not occur before the population becomes more educated and engaged, It must begin in childhood.*

*I enjoyed this article. It required hours for me to extract and condense meaningful aspects of the study. Authors and editors could publish data more clearly and concisely. They could present more detailed data in a linked web site.*

### ***Associated With Increased Mortality Risk***

## **2-3 MORTALITY RISK ASSOCIATED WITH LOW-TRAUMA OSTEOPOROTIC FRACTURE**

The premature mortality following hip and vertebral fractures is well known.

Premature mortality following other fracture types is less well appreciated.

This study examined: 1) the long-term mortality risk following all types of osteoporotic fracture in men and women in different age groups [all over age 60]; 2) the association of a subsequent (a second)

fracture with that mortality risk; 3) what clinical factors present at the time of fracture predict mortality; 4) the effect of fracture on mortality over and above the effect of low bone mineral density (**BMD**)

In the small community of Dubbo Australia (entire population over age 60 = 4005), between 1989 and 2007, 952 women (42%) and 343 (17%) men sustained at least one minimal-trauma fracture. Of those who sustained a fracture, 47% (n = 614) agreed to participate in a detailed on-going assessment. High-trauma fractures; potentially pathological fractures; and fractures of the head, fingers, and toes were excluded. The study included only fractures considered to be *osteoporotic* (fragility fractures).

Median follow-up after the fracture was 12 years.

For each age group, mortality rates in those who sustained a fracture (in both sexes) were consistently higher over the following 5 years than in the general population.

Mortality rates in women	Per 100 person years	Mortality ratio
General population	4.3	
All fractures	7.8	1.8
Hip fracture	15	2.4
Vertebral fracture	9	1.8
Major* fracture	7.8	1.7
Minor** fracture	5	1.4

(\* Major included pelvis, distal femur, proximal tibia, 3 or more ribs, and proximal humerus. \*\* Minor all other osteoporotic fractures.)

Rates in men were higher.

A first fracture was associated with 2- to 4-increased risk of a second fracture. This contributes to the morbidity and mortality burden of fragility fractures. Following a second fracture, the death rate was elevated for a another five years.

Major causes of death were the same as in the general population.

Those with fractures who died were older, had smoked, weighed less, had lower bone density, weaker quadriceps, and decreased physical activity.

When women without fracture were matched by age and BMD with women with fracture, there was *no* difference in mortality. Thus, in the group of women without fracture, low BMD *per se* was an underlying high mortality risk.

A subsequent (second) fracture is clearly an additional risk factor for premature mortality. Its prevention may contribute to a decrease in overall excess mortality.

Conclusion: Low-trauma fractures in older men and women were associated with increased mortality risk for 5 to 10 years. A second (subsequent) fracture increased mortality for an additional 5 years.

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*This presents a splendid challenge and opportunity for primary care, especially when “The Primary Care Medical Home” becomes more common.*

*Preventive therapy of osteoporosis, when begun in earlier life, will shorten the length of disability and dependence, and will lengthen the health-related quality-of-life. It will reduce morbidity, and costs of medical and social care.*

*Go into elderly life with strong bones!*

***Physicians And Patients Share Responsibility Each Contributes To Such Interactions.***

#### **2-4 BURDEN OF DIFFICULT ENCOUNTERS IN PRIMARY CARE**

This study compared levels of stress, burnout, time pressure, and intent to leave practice between primary care physicians who report having high numbers of these patients and those who have fewer.

Physicians (n = 449; either general internists or family physicians) from 5 regions of the US responded to a “Difficult Doctor-Patient Relationship Questionnaire” Physicians were grouped into 3 clusters: those perceiving high, medium, and low numbers of difficult encounters.

The investigators identified eight types of difficult encounters.

Physicians who reported experiencing the highest difficulty with patient encounters were younger, more likely to be female, more likely to be internists than family physicians, to report burnout, to report job dissatisfaction, and to be more likely to leave the practice.

Physicians share responsibility with patients. Each contributes to such interactions.

Strategies to help physicians manage difficult encounters more effectively include: demonstrating more empathy; practicing nonjudgmental listening; providing more support to the physician by social service personnel; and allotting more time for patients likely to be difficult.

*(See the following abstract.)*

***“Each Brings Something To The Table”***

#### **2-5 UNBURDENING THE DIFFICULT CLINICAL ENCOUNTER**

Dealing with dysfunctional encounters is learned after medical school.

A more progressive view is that the problem is dyadic, a consequence of both patient and physician factors. Each brings something to the table.

We should be more circumspect about referring to the “difficult patient”, and refer to the event as a “difficult encounter” or a “difficult physician-patient relationship”.

What makes some encounters difficult?

Patient factors have been identified:

- 1) Psychological symptoms or disorders, especially somatization. And varying degrees of depression, anxiety, personality disorders, and substance abuse.
- 2) Patients who are “high users”, or “frequent attenders”.

Physician factors:

- 1) Psychosocial stress—burnout, job dissatisfaction, personal depression or anxiety, It is impossible to completely disentangle job and personal distress. Each has an adverse effect on the other. The unhappy physician may have a lower tolerance for complex or challenging encounters.
- 2) A bundled approach that tackles organizational, contextual, and physician factors may be more successful in unburdening difficult encounters than addressing only one factor.

What can we do to alleviate the problem?

- 1) Intensify physician training in psychosocial aspects of care. Psychosocially oriented physicians identify fewer encounters as difficult .
- 2) Identify, up front, patient’s expectations for the visit.
- 3) Accept the rough edges of the real world of practice. Do not take every difficulty personally. Concede that discordant encounters are inevitable.
- 4) Reform the context and reimbursements of primary care. Undervaluing cognitive services and “talk time” puts even greater pressure on the 15%-20% of visits considered difficult.
- 5) Celebrate a well-navigated difficult encounter. Dealing with difficulty signifies mastery rather than weakness. “Partnering with patients in the challenging aspects of their health, lives, or medical care is a stepping stone to surmounting together the difficult encounter.”

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*I enjoyed these articles. this is the first time I remember reading about these problems. They are frequent in primary care medicine. I have experienced my share of difficult patients*

*Looking back, I did indeed place the entire burden for the difficulty on the patient. I now recognize I brought some difficulty too.*

### ***Public Awareness Of PD Is Very Low***

#### **2-6 SELF-REPORTED PREDIABETES AND RISK-REDUCTION ACTIVITIES: 2006**

At least one fourth of U.S. adults are known to have prediabetes (**PD**), defined as having impaired fasting glucose (100 mg/dL to 125 mg/dL after an overnight fast), impaired glucose tolerance (plasma glucose 140 to 199 in a 2-hour oral glucose tolerance test), or both.

These persons are at risk for developing type-2 diabetes, heart disease, and stroke.

Public awareness of PD is very low. A CDC analysis of data collected in 2006 found that only 4% of 24 000 adults knew they had PD. Most of these were told they had “borderline diabetes”. The actual prevalence is about 40% in adults age 40-70.

Most patients with PD do not exercise adequately, do not control their weight or restrict fat and calories.

The Diabetes Prevention Program Intervention Trial showed that diet and exercise can lower the incidence of type-2 diabetes by 58% over 3 years among those at high risk. The American Diabetes Association recommends that patients with PD lose 5-10% of body weight, and increase physical activity to at least 150 minutes of moderate exercise weekly.

The article includes criteria for screening. (*See the full abstract*) It concludes by advising all persons over age 45 to be screened.

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*I would not label persons with PD as having “borderline diabetes” I would try to explain that they have difficulty metabolizing sugar. They are overloading their body with excess food.*

*Labeling may increase anxiety and have a negative effect on employment and insurance.*

*This is a perfect opportunity and challenge of primary care medicine. With the advent of a “medical home”, which will increase closer follow-up and continued communication, prevention and treatment of PD can become more efficient. This would lower future costs of care and prolong quality-years-of-life*

***Each Year, 433 000 Premature Deaths; 5 Million Years Of Productive Life Lost; \$200 Billion Productivity Losses + Health Care Expenditures***

## **2-7 SMOKING ATTRIBUTABLE MORTALITY, YEARS OF POTENTIAL LIFE LOST, AND PRODUCTIVITY LOSSES—UNITED STATES, 2000-2004**

This update is based on data from the CDC’s *Smoking Attributable Mortality, Morbidity, and Economic Costs (SAMMEC)* system, which estimates SAM, and years of productive life lost (YPLL).

Each year, during 2000-2004, cigarette smoking and exposure to tobacco smoke (second hand smoke) resulted in at least 433 000 premature deaths, approximately 5 million YPLL, and \$200 billion productivity + health care expenditures

The three leading specific causes of smoking-attributable death:

	Annually
Lung cancer	129 000
Ischemic heart disease	126 000

Leading causes of death, such as lung cancer and COPD could become relatively uncommon in future generations if the prevalence of smoking was substantially reduced.

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*This is not news to primary care clinicians. I abstracted the report as a preface to the following article.*

### ***Financial Incentives Increased Cessation***

## **2-8 A RANDOMIZED, CONTROLLED TRIAL OF FINANCIAL INCENTIVES FOR SMOKING CESSATION**

Work sites offer a promising venue for encouraging smoking cessation. Employers are likely to bear many of the excess burdens related to smoking—absenteeism and health-care costs.

This study tested the effectiveness of a financial incentive in improving long-term cessation.

In 2005-06, recruited 878 employee-smokers (mean age 45; 65% male) of a large company at worksites throughout the USA. Most smoked a pack a day. A few smoked two packs. Mean number of previous attempts to quit = 6. One third were considered highly dependent.

All received information about smoking cessation programs. They were encouraged to participate in a program, but were not required to do so.

Randomized to:

- 1) Financial incentives to stop (n = 436)
- 2) No financial incentives (n = 442)

The financial incentives;

\$100 for completion of a community-based smoking-cessation program.

\$250 for cessation within 6 months of study enrollment.

\$400 for cessation for 12 months. (Total \$750 at one year after randomization.)

Members of the incentive group had higher cessation rates than members of the control group:

	Control (no incentive)	Incentive group
Cessation at 6 months	12% (n = 52)	21% (n = 91)
Continued abstinence at 12 months	5% (n = 22)	15% (n = 64)
Continued abstinence at 18 months	4% (n = 16)	9% (n = 41)

To date, financial incentives within health care settings have been directed primarily toward

providers through *Pay for Performance* programs. Given that up to 40% of premature deaths are due to unhealthy behaviors (smoking, poor diet, and sedentary lifestyle) incentives directed toward patients rather than providers may have greater potential for changing behaviors.

Conclusion: Smoking-cessation among company employees who were given both information about cessation programs and financial incentives to quit was higher than among employees who were given program information but no financial incentives.

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*I wonder how many will still be abstinent in 5 years.*

*On a population basis, these results would be impressive. Reducing prevalence of smoking by 5% is a major achievement.*

*It is interesting that \$750 is more of an incentive for some people to quit than the probability of living 10 years longer and feeling 10 years younger.*

*Financial payment to improve life-styles is not applicable to most persons in the USA. Higher costs for health and life insurance for persons who smoke and those with obesity may influence some to improve their lifestyles. Preference in hiring may also help.*

### ***Questions and Answers from A National Conference***

#### **2-9 BLOOD PRESSURE SELF-MONITORING**

BP monitors are inexpensive. They are now used by many patients with in the USA to self-monitor BP (SMBP).

This review, based on available evidence from randomized trials, systematic reviews and expert consensus, discusses the critical importance of SMBP in establishing the diagnosis of hypertension, subsequent titrating drug treatment, and long-term monitoring.

BP can vary widely. SMBP allows multiple measurements and therefore provides a more precise measure of “true” BP, and information on the variability of BP.

Integrating SMBP into daily practice requires appropriate equipment, systems, and education—of patients and their doctors.

This article reviews many questions asked about SMBP. *(Please read the full abstract.)*

Summary:

SMBP readings are usually lower than office readings.

SMBP is useful in the diagnosis and management of hypertension.

Multiple measurements allow a better estimation of “true” BP.

SMBP correlates better with risk of stroke than office readings.

Patient education and clinically validated monitors are prerequisites.

What needs confirmation:

How should SMBP be used as opposed to office management to assess risk of cardiovascular disease?

Should SMBP be intermittent (6 monthly) or weekly?

What is the effectiveness and the cost-effectiveness of treatment based on SMBP vs standard care?

What is the effect of SMBP on long-term BP control?

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*The critical question remains: Does SMBP, compared with office BP, further reduce risk of stroke, myocardial infarction and heart failure?*

*I believe many patients and health care workers do not realize how variable BP is. We depend on average readings at rest. Many office visits begin with a BP reading by an office nurse taken only once. The nurse then states, "Your BP is . . ."*

*SMBP has the advantage of allowing adjustment of dose of anti-hypertension drugs. Lowering the dose is just as important as raising the dose.*

## ABSTRACTS FEBRUARY 2009

### 2-1 ASSOCIATION BETWEEN SERUM 25-HYDROXYVITAMIN D LEVEL AND UPPER RESPIRATORY TRACT INFECTION: The Third National Health and Nutrition Examination Survey

More than 200 viruses contribute to the clinical syndrome of cough, nasal congestion, nasal discharge, sore throat and sneezing.

The frequency of upper respiratory infections (**URTI**) results in high population morbidity and costs. Options for curing and preventing URTI are limited. Treatment relies on symptom relief.

For decades, vitamin C has been marketed and used for prevention and treatment. Convincing evidence of efficacy in community populations is lacking. Prevention of colds/influenza and “immune boosting” remain the top reasons that Americans take vitamins and herbal supplements.

Vitamin D is contained in few foods. Sunlight is the primary determinant of vitamin D status.

The importance of vitamin D in general health has expanded far beyond rickets. It is involved in the regulation of 1000 human genes. It seems to have promise in the prevention of infection, including URTI. In northern latitudes, November to March, there is insufficient sunlight. Some authorities have suggested that vitamin D deficiency in winter may partially account for the seasonal variation in influenza.

Vitamin D plays an important role in innate immunity. Respiratory tract infections have been strongly linked epidemiologically with rickets. Although 25[OH]D serum levels of 10 ng/mL prevent rickets, at least 30 ng/dL are advantageous for good health. Approximately 40 ng/mL is considered optimal.

This study examined the association between serum 25[OH]D levels and URTI in a large cross sectional sample representative of the entire US population. The hypothesis was that URTI are inversely related to 25[OH]D levels.

Conclusion: Recent URTI were inversely associated with serum 25[OH]D levels.

#### STUDY

1. The Third National Health and Nutrition Examination Survey was conducted in 1988-1994.

This secondary analysis examined the association between 25[OH]D and recent URTI in over 18 000 participants over age 12 (median age = 38). All had serum levels of 25[OH]D determined at baseline.

2. The analysis was adjusted for season, BMI, smoking, asthma, and COPD.

3. Participants were asked if they had a cold or cough in the past few days.

4. Categorized 25[OH]D levels as: 1) less than 10 ng/dL; 2) 10 to less than 30. and 3) 30 and over.

## RESULTS

1. Serum D	Number	%	Recent URI (%)
< 10	684	2	24
10-<30	12 302	53	20
30 and above	5897	45`	17

2. Participants with levels < 10 had 55% higher odds of a recent URTI, and those with levels 10-30 had 27% higher odds of a recent UTI compared with those whose level was 30 and above.
3. Regardless of season, those with levels > 30 had fewer URTIs than those with levels 10-30. Those with levels < 10 had the highest incidence.
4. The association seemed to be stronger in individuals with asthma and COPD.

## DISCUSSION

1. "The association seems to be robust, with a clinically and statistically significant association present in all seasons, and when controlled for potential confounders."
2. The role of 25[OH]D may be of greater importance in patients with asthma and COPD.
3. A recent study of Finnish soldiers with levels < 16 at baseline reported a 63% increased risk of absence from duty due to RTIs. Case-control studies from India and Turkey reported an association between D levels < 20 and acute *lower* RTIs in children and neonates.
4. Two interventional studies: 1) 600-700 IU daily and 2) 60 000 IU weekly from supplements found a decrease in RTIs in children.
5. Another randomized, controlled trial in postmenopausal women receiving 800 to 2000 IU daily reported RTIs in 8% vs 25% in controls
6. Cathelicidin<sup>1</sup> has a defined D-dependent mechanism. Sufficient levels of circulating 25[OH]D are necessary to activate cathelicidin and enhance macrophage function and innate immunity. A level of 30 ng/dL or more may be necessary for optimal induction of cathelicidin.
7. Current recommendations for D supplementation (200-600 IU daily) are unlikely to achieve optimal serum levels. Supplementation with 1000 IU or more daily, particularly in the winter at higher latitudes, may be required.

## CONCLUSION

Serum 25[OH]D levels had an independent inverse association with recent URTI.

Adequate supplementation may reduce incidence of URTIs.

Archives Int Med February 23, 2009; 169: 384-390 Original investigation, first author Adit A Ginde, University of Colorado Aurora, Colorado.

**1 Cathelicidin:** A family of polypeptides found in lysosomes in polymorphonuclear leukocytes, and in other cells including epithelial cells and macrophages. It is activated by bacteria, viruses, fungi, and 25[OH] D. It serves a critical role in the innate defense against invasive bacterial infectious. (Wikipedia 4/6. 2008)

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***Behavioral Factors Rather Than Macronutrient Metabolism is The Main Influence on Weight Loss.***

**2-2 COMPARISON OF WEIGHT-LOSS DIETS WITH DIFFERENT COMPOSITIONS OF FAT, PROTEIN, AND CARBOHYDRATES**

A crucial question is whether overweight people have a better response in the long-term to diets that emphasize a specific macronutrient composition—protein, fat, or carbohydrate.

Debate has been intense. Studies reach varying conclusions. Few studies extend beyond one year.

The authors of this study recognized the need for a large trial designed to overcome the limitations of previous trials. This trial lasted 2 years because weight loss typically is greatest 6 to 12 months after initiation, with steady regain in weight subsequently.

Conclusion: The type of diet makes no difference.

**STUDY**

1. Randomized clinical trial assigned over 800 overweight and obese adults (mean age 50; BMI 33; about 2/3 female) to 4 different energy-reduced diets, and compared their effects on body weight .

2. Randomly assigned to:	Total fat (%)	Protein (%)	Carbohydrate (%)
1) Low-fat, average-protein	20	15	65
2) Low-fat, high-protein	20	25	55
3) High-fat, average-protein	40	15	45 ( <i>Close to a usual diet</i> )
4) High-fat, high-protein	40	25	35

3. Two diets were low fat and two were high fat. Two were average protein; two high protein.

Carbohydrate intake ranged from 35% to 65%.

4. Diets contained 8% or less of saturated fat, at least 20 g of dietary fiber, and 150 mg or less of cholesterol per 1000 kcal.

5. Each participant's caloric prescription represented a deficit of 750 kcal per day from baseline.
6. Group training sessions were held frequently. Daily meal plans were provided.
7. The goal for physical activity was 90 min of moderate exercise weekly.
8. Primary outcome = change in body weight over 2 years.

## RESULTS

### 1. Baseline characteristics (means):

BMI	33
Weight (kg)	93
Waist circumference (cm)	103
Daily energy intake	2000 kcal
Carbohydrate	45%
Fat	37%
Protein	18%

2. At 6 months, participants who completed the study had a mean weight loss of 6.5 kg. This corresponds to a reduction in daily energy intake of approximately 225 kcal. (The goal was a reduction of 750 kcal.)
3. After 12 months, participants began to regain weight.
4. Weight loss (kg) at 2 years:

	As originally assigned (n = 811)*	Completers at 2 years (n = 645; 80%)
15% protein	3.0	3.6
25% protein	3.6	4.5
20% fat	3.3	4.1
40% fat	3.3	3.9
65% carbohydrate	2.9	3.4**
35% carbohydrate	3.4	4.0**

(\*Intention-to-treat \*\* My assessment from figure 1 page 864))

Differences between groups were not statistically significant.

5. Among the 80% who completed the 2 years, the average weight loss was greater than among those as originally assigned; 31% to 37% had lost at least 5% of body weight; 15% had a reduction of at least 10% of initial weight; 2% to 4% lost 20 kg or more. A total of 185 participants (23%) continued to lose weight from 6 months to 2 years—to a total mean loss of 8 kg. There was no significant difference between groups.

6. Satiety, hunger, satisfaction with the diet, and attendance at group meetings were similar between diets.
7. Waist circumference decreased by about 4 cm, with no statistically significant differences between groups.
8. The diets improved lipids and fasting insulin levels.
9. Attendance at group sessions strongly predicted weight loss.

## DISCUSSION

1. “The principal finding is that the diets were equally successful in promoting clinically meaningful weight loss over the course of 2 years.”
2. The population was diverse. The participants were eager to lose weight. Despite intensive behavioral counseling participants had difficulty achieving the goals of macronutrient intake of their assigned group.
3. The study had a large sample, a high rate of retention, and the sensitivity to detect small changes in weight.
4. “The findings should be directly applicable to both clinicians’ recommendations for weight loss in individual patients and the development of population-wide recommendations by public health officials”
5. Trials of low-calorie-carbohydrate diets have reported a very low incidence of urinary ketosis after 6 months, suggesting that, in most overweight people, it is futile to sustain a low intake of carbohydrates.
6. Participants assigned to a high fat average protein diet [Diet 3 above] did not have to change their diet very much and could focus more on reducing caloric intake.
7. Participants in the high-protein or low fat groups had more challenging dietary goals.
8. “We view attendance at counseling sessions as a proxy for commitment to achieving weight loss and for engagement in the program.” High attendees lost more weight and were less likely to regain after one year. Continued contact is essential.
9. Patients in weight-loss programs revert to their customary macronutrient intakes over time, but some may nonetheless be able to maintain weight loss.
10. “These findings point to behavioral factors rather than macronutrient metabolism as the main influences on weight loss.” Any type of diet, when taught for the purpose of weight loss with enthusiasm and persistence can be effective. The specific macronutrient content is of minor importance. “Calories do count.”

## CONCLUSION

Diets that are successful in causing weight loss can emphasize a range of fat, protein, and carbohydrate compositions that have beneficial effects.

Such diets can be tailored to individual patients on the basis of their personal and cultural preferences and may have the best chance for long-term success.

NEJM February 26, 2009. 360: 859-73 Original investigation, first author Frank M Sacks, Harvard School of Public Health, Boston, Mass.

Study supported by the National Institutes of Health

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### *Associated With Increased Mortality Risk*

## **2-3 MORTALITY RISK ASSOCIATED WITH LOW-TRAUMA OSTEOPOROTIC FRACTURE**

The premature mortality following hip and vertebral fractures is well known.

Premature mortality following other fracture types is less well appreciated.

This study examined: 1) The long-term mortality risk following all types of osteoporotic fracture in men and women in different age groups; 2) The association of a subsequent (a second) fracture with that mortality risk; 3) What clinical factors present at the time of fracture predicted mortality; 4) The effect of fracture over and above low bone mineral density (**BMD**) on mortality.

Conclusion: All low-trauma fractures in older women and men were associated with increased mortality over 5 to 10 years.

## STUDY

1. This longitudinal population-based study included all men and women over age 60 living in Dubbo Australia. In 1989, the entire population over age 60 consisted of 2245 women and 1989 men.
2. Between 1989 and 2007, 952 women (42%) and 343 (17%) men sustained at least one minimal-trauma fracture.
3. Of those who sustained a fracture, 47% (n = 614) agreed to participate in a detailed on-going assessment. High-trauma fractures; potentially pathological fractures; and fractures of the head, fingers, and toes were excluded. The study included only fractures considered to be *osteoporotic* (fragility fractures).
4. Median follow-up after the fracture was 12 years.

## RESULTS

1. For each age group, mortality rates in those who sustained a fracture (in both sexes) were consistently higher over the following 5 years than in the general population.
2. Absolute mortality rates over all age groups were highest in the first 5 years after fracture. Rates declined thereafter toward the expected rate, except for hip fracture which continued to be a risk factor for increased mortality for another 5 years.

3. Mortality rates in women	Per 100 person years	Mortality ratio
General population	4.3	
All fractures	7.8	1.8
Hip fracture	15	2.4
Vertebral	9	1.8
Major* fracture	7.8	1.7
Minor** fracture	5	1.4

(\* Major included pelvis, distal femur, proximal tibia, 3 or more ribs, and proximal humerus. \*\* Minor all other osteoporotic fractures..)

Rates in men were higher.

4. Premature mortality was observed in all age groups in those sustaining a major fracture.
5. Non-hip fractures were associated with 28% of deaths in women.
6. Many subjects sustained a second fracture. Following these, the death rate was elevated for another five years.
7. Major cause of death was the same as in the general population.
8. Those with fractures who died were older, had smoked, weighed less, had lower bone density, weaker quadriceps, and decreased physical activity.

## DISCUSSION

1. "Given these findings, more attention should be given to non-hip, non-vertebral fractures that constituted 50% of all low-trauma fractures, and were associated with 40% of deaths."
2. A first fracture was associated with 2- to 4-increased risk of a second fracture. This contributes to the morbidity and mortality burden of fragility fractures.
3. The mechanism for increased fracture-associated mortality is uncertain. Some of the increased risk may be due to the underlying health of the patients, including dementia, co morbid conditions, "frailty", weakness, and low bone density. "It remains to be determined exactly what is responsible for the increased mortality following fracture."

4. When women without fracture were matched by age and BMD with women with fracture, there was *no* difference in mortality. Thus, in the group of women without fracture, low BMD *per se* was an underlying high mortality risk.
5. A recent randomized trial of bisphosphonate treatment of men and women after a hip fracture reported significantly decreased mortality.
7. A subsequent (second) fracture is clearly an important risk for associated premature mortality. Its prevention may contribute to a decrease in overall excess mortality.

## CONCLUSION

Low-trauma fractures in older men and women were associated with increased mortality risk for 5 to 10 years. A second (subsequent) fracture increased mortality for an additional 5 years.

JAMA February 4, 2009; 301: 513-21 Original investigation, The Dubbo Osteoporosis Epidemiology Study, first author Dana Bliuc, St Vincent's Hospital, Sydney, Australia.

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*Physicians And Patients Share Responsibility Each Contributes To Such Interactions.*

### **2-4 BURDEN OF DIFFICULT ENCOUNTERS IN PRIMARY CARE**

Difficult encounters are more likely to occur with patients who have a mental disorder, present with multiple somatic symptoms, exhibit high use of health services, possess a list of complaints, and have threatening or abrasive personalities.

Physicians report that they secretly hope these patients will not return, and find the encounters time consuming and professionally unsatisfying.

This study compared levels of stress, burnout, time pressure, and intent to leave practice between primary care physicians who report having high numbers of these patients and those who have fewer.

Physicians (n = 449; either general internists or family physicians) from 5 regions of the US responded to a "Difficult Doctor-Patient Relationship Questionnaire" Physicians were grouped into 3 clusters: those perceiving high, medium, and low numbers of difficult encounters.

Difficult encounters were described, in order of frequency:

- 1) Insist on being prescribed an unnecessary drug
- 2) Show dissatisfaction with your care
- 3) Have unrealistic expectations
- 4) Visit regularly, but ignore advice

- 5) Persistently complain, although you have done everything possible to help
- 6) Insist on an unnecessary test
- 7) Are verbally abusive
- 8) Do not express appropriate respect

Physicians who reported experiencing the highest difficulty with patient encounters were younger, more likely to be female, more likely to be internists than family physicians, to report burnout, to report job dissatisfaction, and to be more likely to leave the practice.

Difficult encounters are a readily recognized challenge in primary care. They occur frequently. Physicians share responsibility with patients. Each contributes to such interactions.

Older, more experienced physicians may have developed coping mechanisms to mitigate the difficulty.

The high burnout reported by many has implications for the future of primary care. Fewer trainees are choosing careers in primary care.

Strategies to help physicians manage difficult encounters more effectively include: demonstrating more empathy; practicing nonjudgmental listening; providing more support to the physician by social service personnel<sup>1</sup> and allotting more time for patients likely to be difficult.

Archives Int Med February 23, 2009; 169: 410-14 Original investigation, first author Perry G An, Newton-Wellesley Hospital, Newton, Mass.

**1** As might be more available in a well organized “medical home”.

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***“Each Brings Something To The Table”***

**2-5 UNBURDENING THE DIFFICULT CLINICAL ENCOUNTER**

*(This editorial comments and expands on the preceding article.)*

The problem is pervasive, but seldom commented on. Every physician experiences difficult encounters. Difficult patients are often termed “heartsink”, “problem”, or “frustrating”.

Dysfunctional encounters might be classified as defects in “physician-patient relationships”, or “health communication”.

Clinical research, the medical curriculum, and continuing education focus predominantly on diseases manifested in a particular patient. Dealing with dysfunctional encounters is learned after medical school.

A more progressive view is that the problem is dyadic, a consequence of both patient and physician factors. Each brings something to the table. An asymmetry in the relationship exists wherein the physician carries a greater responsibility for empathy and “turning the other cheek”.

We should be more circumspect about referring to the “difficult patient”, and refer to the event as a “difficult encounter” or “difficult physician-patient relationship”.

“Although blaming the patient for a difficult encounter is now considered philistine, the mutual distress and dissatisfaction suffered during these ‘clashes’ is real”.

What makes some encounters difficult?

Patient factors have been identified:

- 1) Psychological symptoms or disorders, especially somatization. And varying degrees of depression, anxiety, personality disorders, and substance abuse.
- 2) Patients who are “high users”, or “frequent attenders”.

Physician factors:

- 1) Psychosocial stress—burnout, job dissatisfaction, personal depression or anxiety,  
It is impossible to completely disentangle job and personal distress. Each has an adverse effect on the other. The unhappy physician may have a lower tolerance for complex or challenging encounters.
- 2) A bundled approach that tackles organizational, contextual, and physician factors may be more successful in unburdening difficult encounters than addressing only one factor.

What can we do to alleviate the problem?

- 1) Intensify physician training in psychosocial aspects of care. Psychosocially oriented physicians identify fewer encounters as difficult .
- 2) Identify patient’s expectations for the visit up front <sup>1</sup>
- 3) Accept the rough edges of the real world of practice. Do not take every difficulty personally.  
Concede that discordant encounters are inevitable.
- 4) Reform the context and reimbursements of primary care. Undervaluing cognitive services and “talk time” puts even greater pressure on the 15%-20% of visits considered difficult.
- 5) Celebrate a well-navigated difficult encounter. Dealing with difficulty signifies mastery rather than weakness. “Partnering with patients in the challenging aspects of their health, lives, or medical care is a stepping stone to surmounting together the difficult encounter.”

1 Asking patients to prepare an agenda before the visit may help.

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## 2-6 SELF-REPORTED PREDIABETES AND RISK-REDUCTION ACTIVITIES: 2006

At least one fourth of U.S. adults are known to have prediabetes (**PD**), defined as having impaired fasting glucose (100 mg/dL to 125 mg/dL after an overnight fast), impaired glucose tolerance (plasma glucose 140 to 199 after a 2-hour oral glucose tolerance test), or both.

These persons are at risk for developing type-2 diabetes, heart disease, and stroke.

Lifestyle changes can prevent or delay development of diabetes and its complications in persons with PD.

The CDC analyzed responses to questions asked in 2006 by the National Health Interview Survey, an annual nationally representative survey of non-institutionalized U.S. civilian population. The survey included over 24 000 adults.

Participants were asked 5 questions related to the possibility of their having PD; 984 (4%) reported positively; Most of these were told they had “borderline diabetes”. Prevalence increased with age, and weight. PD was more prevalent in women.

Participants were also asked three questions regarding risk-reduction activities: Weight control; physical activity; and fat and calorie restriction; 42% reported engaging in all 3 activities; 24% engaged in none.

Based on laboratory testing in the National Health and Nutrition Examination Survey in 2003-2006, 26% of U.S. adults were estimated to have impaired fasting glucose. A survey in 1988-1994, based on oral glucose tolerance tests, estimated that 40% of adults age 40-70 had impaired glucose tolerance. .

Awareness of PD is very low.

Relatively few persons have been tested for PD.

The Diabetes Prevention Program Intervention Trial showed that diet and exercise can lower the incidence of type-2 diabetes by 58% over 3 years among those at high risk. The American Diabetes Association recommends that patients with PD lose 5-10% of body weight, and increase activity to at least 150 minutes of moderate exercise weekly. Metformin should be considered under some circumstances.

Interventions to prevent or delay onset of type-2 diabetes in patients with PD are feasible and cost effective.

Increased awareness of PD presents an opportunity to reduce the burden of diabetes.

Criteria for testing for PD and diabetes in asymptomatic adults:

1) Overweight (BMI > 25) and having any of the following additional risk factors:

Physical inactivity

First-degree relative with diabetes

Member of a high risk population (eg, African American, Latino)

Women who delivered a baby > 9 pounds or diagnosed as gestational diabetes

Hypertension (BP > 140/90) or on therapy for hypertension

HDL cholesterol < 35 mg/dL, and/or triglyceride > 250 mg/dL

History of cardiovascular disease

Severe obesity

2) All persons over age 45. "In the absence of these risk factors, testing for PD should begin at age 45."

(American Diabetes Association Diabetes Care 2008; 31 (Suppl 1): S512-54

MMWR 2008; 57: 1203-05 reported in JAMA by the CDC February 11, 2009; 301: 591-93 first author D R Rolka, CDC, Atlanta GA.

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## **2-7 A RANDOMIZED, CONTROLLED TRIAL OF FINANCIAL INCENTIVES FOR SMOKING CESSATION**

Seventy % of smokers report that they want to quit. Annually only about 2% succeed.

Work sites offer a promising venue for encouraging smoking cessation. Employers are likely to bear many of the excess burdens related to smoking--absenteeism and health-care costs.

This study tested the effectiveness of a financial incentive in improving long-term cessation.

Conclusion: Financial incentives increased cessation.

### **STUDY**

1. In 2005-06, recruited 878 employee-smokers (mean age 45; 65% male) of a large company<sup>1</sup> at worksites throughout the USA. Most smoked a pack a day. A few smoked two packs. Mean number of previous attempts to quit = 6. One third was considered highly dependent.
2. A survey asked about their smoking habits and their willingness to be contacted about participation in a smoking-cessation study.

3. Employees were eligible to participate if they reported currently smoking five or more cigarettes daily.
4. All received information about smoking cessation programs. They were encouraged to participate in a program, but were not required to do so. The company continued standard health benefits including bupropion and other drugs prescribed to aid cessation.
5. Randomized to:
  - 1) Financial incentives to quit (n = 436)
  - 2) No financial incentives (n = 442)
6. The financial incentives;
  - \$100 for completion of a community-based smoking-cessation program.
  - \$250 for cessation within 6 months of study enrollment.
  - \$400 for cessation for 12 months. (Total \$750 at one year after randomization.)
7. Cessation was confirmed by a cotinine test on urine or saliva. (*A metabolite of nicotine*)
8. Participants were interviewed and retested at 3 months, 6 months and 12 months after enrollment.
9. Primary endpoint = abstinence at both 6 and 12 months after enrollment.

## RESULTS

- 1 Members of the incentive group had higher cessation rates than members of the control group.
2. Outcomes:
 

	Control (no incentive)	Incentive group
Cessation at 6 months	12% (n = 52)	21% (n = 91)
Continued abstinence at 12 months	5% (n = 22)	15% (n = 64)
Continued abstinence at 18 months	4% (n = 16)	9% (n = 41)
3. Members of the incentive group who participated in a smoking-cessation program had higher rates of cessation than those in the control group who participated. (11% vs 3%)

## DISCUSSION

1. The optimum design for incentive programs for smoking cessation is an open question. Would extension of incentives beyond 12 months result in higher cessation rates?
2. To date, financial incentives within health care settings have been directed primarily toward

providers through *Pay for Performance* programs. Given that up to 40% of premature deaths are due to unhealthy behaviors (smoking, poor diet, and sedentary lifestyle) incentives directed toward patients rather than providers may have greater potential for changing behaviors.

3. One approach would be to adjust health-insurance premiums on the basis of smoking status.
4. The financial benefit to employers of having their employees quit smoking is estimated to be about \$3,400 per year, as a result of increased productivity, decreased absenteeism, and reduced incidence of illness.
5. There is strong evidence that employees prefer to work for firms that offer effective and attractive benefit programs.
6. Most relapses occur within the first month of cessation. About 90% occur in the first 6 months  
The likelihood of abstinence over a 20-month period is about 95% for smokers who quit for one year or longer.

## CONCLUSION

Smoking-cessation among company employees who were given information about cessation programs and financial incentives to quit was higher than among employees who were given program information but no financial incentives.

NEJM February 12, 2009 360: 699-709 Original investigation, first author Kevin G Volpp, Philadelphia Veterans Affairs medical Center and University of Pennsylvania, Philadelphia, PA

### 1 General Electric

A news release reported that GE is so impressed that it plans to offer an incentive program nationwide next year, aiming to save \$50 million annually resulting from reduced health care costs.

The study is more complicated than I have indicated. I have abridged it for clarity. RTJ

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***Each Year, 433 000 Premature Deaths; 5 Million Years Of Productive Life Lost; \$200 Billion Productivity Losses + Health Care Expenditures***

## **2-8 SMOKING ATTRIBUTABLE MORTALITY, YEARS OF POTENTIAL LIFE LOST, AND PRODUCTIVITY LOSSES—UNITED STATES, 2000-2004**

Cigarette smoking and exposure to tobacco smoke are associated with premature death from chronic diseases, economic loss to society, and a substantial burden on the US health-care system.

Smoking is the primary causal factor for at least 30% of cancer deaths, 80% of deaths from chronic obstructive pulmonary disease, and for early cardiovascular disease and deaths

This update is based on data from the CDC's *Smoking Attributable Mortality, Morbidity, and Economic Costs (SAMMEC)* system, which estimates SAM, and years of productive life lost (YPLL).

During 2000-2004, cigarette smoking and exposure to tobacco smoke (second hand smoke) resulted in at least 433 000 premature deaths, approximately 5 million YPLL, and \$96 billion in productivity losses annually.

Smoking –attributable residential fire-related deaths and lung cancer and heart disease deaths attributable to exposure to second hand smoke were included in the SAM.

The three leading specific causes of smoking-attributable death:

	Annually
Lung cancer	129 000
Ischemic heart disease	126 000
COPD	93 000

Smoking during pregnancy resulted in an estimated 776 infant deaths each year.

Deaths from fires resulting from smoking each year were over 700 annually.

An estimated annual 50 000 lung cancer and heart disease deaths were attributed to *secondhand* smoke.

The annual YPLL was over 5 million.

Productivity losses + healthcare expenditures due to smoking were approximately \$200 billion each year.

“Although smoking prevalence has declined dramatically since its peak in the 1960s, the number of attributable deaths has remained relatively unchanged, primarily because of increases in population size (particularly among older age groups),” The absolute number of deaths is increasing as the total population increases. Cohorts of smokers with the highest peak prevalence have now reached the ages with the highest incidence of smoking-attributable diseases.

Leading causes of death, such as lung cancer and COPD could become relatively uncommon in future generations if the prevalence of smoking was substantially reduced.

MMWR 2008; 57: 1203-05 and JAMA February 11, 2009; 301: 591-94 Reported by National Center for Chronic Disease Prevention and Health Promotion, CDC, Atlanta GA, first author B Adhikari.

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## *Questions And Answers From A National Conference*

### **2-9 BLOOD PRESSURE SELF-MONITORING**

BP monitors are inexpensive. They are now used by many patients in the USA to self-monitor BP (SMBP).

This review, based on available evidence from randomized trials, systematic reviews and expert consensus, discusses the critical importance of SMBP in establishing the diagnosis of hypertension, subsequent titrating of drug treatment, and long-term monitoring.

BP can vary widely. SMBP allows multiple measurements and therefore provides a more precise measure of “true” BP, and information on the variability of BP.

Integrating SMBP into daily practice requires appropriate equipment, systems, and education—of patients and their doctors.

- **Faster diagnosis:** Morbidity and mortality are significantly lower in patients whose BP is reduced earlier rather than late. SMBP can provide more precise data in a shorter time than office measurements.
- **Improved accuracy:** SMBP can improve diagnostic and predictive accuracy. One large cohort study found that each 10 mmHg increase above the upper limit of 135/ 85 was associated with a 17% increase in risk of cardiovascular disease.
- **Reduced risk:** SMBP can avoid two situations where office BP can mislead—white coat hypertension and masked hypertension (the opposite of white coat). Risk of death from cardiovascular disease increases progressively from 1) normal readings at home and in the office, to 2) white coat hypertension, then 3) masked hypertension, and finally to 4) increased BP at home and in the office. One large cohort study found that the prognosis for masked hypertension was similar to that of uncontrolled office BP. However, masked hypertension is rarely found.
- **Long term control:** Several randomized trials have examined the effect of SMBP on BP, but not on clinical outcomes. A 2004 meta-analysis of 18 randomized controlled trials of SMBP reported small reductions in BP in the treated groups, but not the chances of reaching target BP. “Home monitoring alone seems to have only a modest effect.”
- **How may SMBP reduce BP:**
  - Better adjustment of drug dose.
  - Improved compliance with scheduled treatment.
  - Improved non-pharmacological interventions.
  - Better long-term coordination between patient and doctor.

- Difference between home and office BP:

Most home measurements BPs are lower than office BP. The British Hypertension Society suggests a “correction” factor of 10/5.

Recommendations from the US and Europe have settled on a threshold for SMBP of 135/85 as the home target for diagnosis of hypertension.

- How do I use SMBP?

Diagnosis: Current guidelines suggest a mean of 7 days of readings (2 in the morning and 2 in the evening) for 7 days, discarding the first day, to establish a baseline.

Titration of drugs: There is no clear evidence on how long to monitor after titration of drugs using either office or home measurements. It depends on how long it takes for the pharmacological effects (typically five half lives) and biological effects (varies between drugs) to become apparent.

Long-term monitoring for people on stable treatment:

One large study found that true changes in BP occur slowly. For patients on stable treatment, a reasonable time-frame for re-measurement would be 6 to 12 months.

Scheduling: BP varies during the day. Drugs are typically taken in the morning. This may result in peaks and troughs during the day. It has been recommended that readings be taken morning and evening.

- Monitoring process:

Accurate and easy-to-use monitors are needed for optimum SMBP.

Use upper arm. (Not the wrist.)

Monitors should be calibrated according to manufacturer’s instructions.

For patients who cannot purchase a machine, some doctors provide machines patients can borrow intermittently, or use in the office. The efficacy of SMBP in the practice waiting room is broadly similar to monitoring at home.

- Patient education:

Use a validated and calibrated machine.

Appropriate positioning of the cuff—correct seated position, legs uncrossed, arm supported.

Arm position at heart level. No smoking. Talking may increase BP.

Timing of readings should be consistent in terms of taking drugs, exercise, smoking, eating and drinking.

- Protocol for SMBP:

If SMBP is over 135/85, calculate overall cardiovascular risk and consider treatment.

After starting drug treatment, or after any change in treatment, repeat SMBP protocol after 4 to 6 weeks.

When SMBP is less than 135/85, monitor at intervals of 9 to 12 months, or earlier if clinical circumstances change.

- The advantages of SMBP:

Results in a better estimation of “true” BP. (Reduces inherent variability)

Removes the problem of white coat hypertension and masked hypertension.

Empowers patients.

Is convenient for patients.

May lead to better BP control.

- Potential disadvantages:

Measurements are hard to interpret because current evidence of risk of morbidity and mortality is based on office measurements.

Current treatment recommendations are based on office measurements.

Measurements may be inaccurate.

Risks overmedication.

Requires motivation by professionals as well as patients.

- Summary:

SMBP readings are usually lower than office readings.

SMBP is useful in the diagnosis and management of hypertension.

Multiple measurements allow a better estimation of “true” BP.

SMBP correlates better with risk of stroke than office readings.

Patient education and clinically validated monitors are prerequisites.

- What needs confirmation:

How should SMBP be used as opposed to office management to assess risk of cardiovascular disease?

Should SMBP be intermittent (6 monthly) or weekly?

What is the effectiveness and the cost-effectiveness of treatment based on SMBP vs standard care?

What is the effect of SMBP on long-term BP control?

BMJ January 3, 2009; 338: 38-42 “Clinical Review”, based on a National Self-monitoring conference  
July 2008 at Oxford UK, first author Richard J McManus, University of Birmingham, Birmingham, UK

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