Patient decision aid: Type 2 diabetes — blood pressure control

What this patient decision aid is for?

This decision aid is intended to assist healthcare professionals in consultations with patients who have type 2 diabetes. It relates to patients considering whether or not to tightly control their blood pressure (BP).

How much does controlling BP improve outcomes in patients with type 2 diabetes?

In the BP-lowering arm of UKPDS 'tight control' of BP achieved a reduction in risk of stroke, diabetes related deaths **and** microvascular events.[1]

The BP-lowering arm of UKPDS included 1148 hypertensive patients with type 2 diabetes. It compared tight control of BP (aiming for less than 150/85mmHg) with less tight control (aiming for less than 180/105mm Hg), for a median follow up of 8.4 years.[1]

A benefit was seen for tight BP control compared with less tight control. ***Relative*** risk reductions were 24% for diabetes related end points (95% confidence interval [CI] 8–38%; p=0.0046), 32% in deaths related to diabetes (95% CI 6–51%; p=0.019), 44% in strokes (95% CI 11 –65%; p=0.013), and 37% in microvascular end points (95% CI 11– 56%; p=0.0092), predominantly owing to a reduced risk of retinal photocoagulation.[1]

The diagrams (Cates plots) on the next pages give a pictorial representation of the ***absolute*** risk reductions for these results. They show what happens with and without tight BP control in a group of 100 people with type 2 diabetes over approximately 8 years.

So tight control of BP produced a statistically significant benefit in terms of cardiovascular outcomes and diabetic mortality, unlike blood glucose control with sulphonylurea or insulin in another arm of the study which did not achieve any significant benefits in terms of mortality or cardiovascular outcomes.[2]

What BP Targets?

NICE guidelines for type 2 diabetes set a target to aim for in people with type 2 diabetes of less than 130/80mmHg if they have kidney, eye or cerebrovascular disease, or less than140/80mmHg if they don't have such damage.[3] However, both these targets can be challenging to meet, and agreeing individualised targets is important, as any reduction in BP towards these levels is likely to be beneficial.

What treatments?

Lifestyle advice should be offered in the first instance. This includes advice on diet, exercise, stopping smoking and reducing alcohol, caffeine and salt intake. If drug treatment is needed, the first-line antihypertensive agent for most people with type 2 diabetes is a once-daily, generic ACE inhibitor. Exceptions are people of African-Caribbean descent or women for whom there is a possibility of becoming pregnant.[3]

If individually agreed BP targets are not met, it is recommended that treatment is stepped up to dual therapy with an ACE inhibitor and either a thiazide diuretic or a calcium-channel blocker, then triple therapy with all three of these.[3] Most people with type 2 diabetes will need more than one antihypertensive to reduce their BP sufficiently, and a generic ACE inhibitor plus bendroflumethiazide 2.5 mg once daily seems a reasonable choice for many.

If people are already on antihypertensives at the time of diagnosis, changes should only be made to their medication if there is poor BP control or if current medications are not appropriate because of metabolic problems or microvascular complications (for example, they have kidney damage and should, therefore, be on an ACE inhibitor).[3]

Source of images

The images have been produced using Dr Chris Cates software VisualRx 3.0. More information can be obtained from the website www.nntonline.net.

References

1. UK Prospective Diabetes Study Group. Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. BMJ 1998;317:703–713.
2. UK Prospective Diabetes Study (UKPDS) Group. Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). Lancet 1998;352:837–853.
3. NICE. Type 2 diabetes: the management of type 2 diabetes (update). Clinical Guideline 66. May 2008.

Tight control of BP — death from diabetic complications

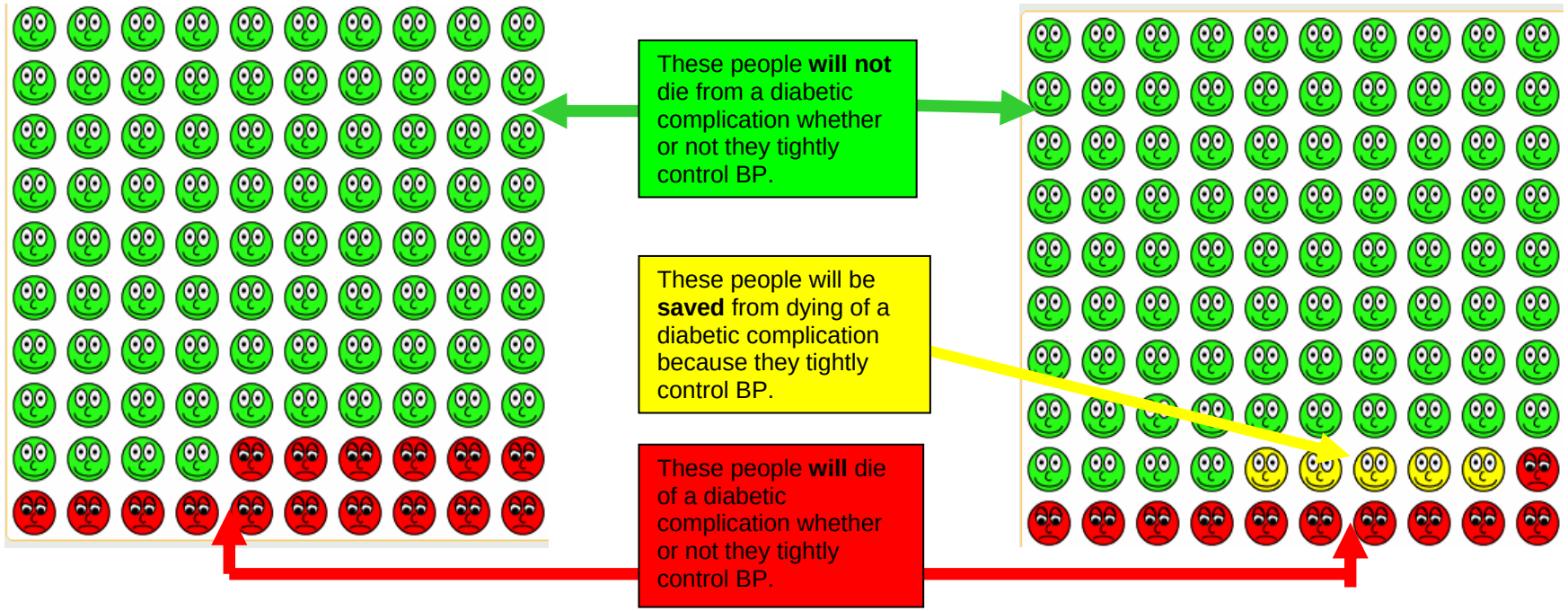
Imagine 100 people like those in this part of UKPDS. Without tight control of their BP about 16 (16%) of them would die from a diabetes related complication over the next 8 years. So, 84 (84%) of them would not die from a diabetic complication (100 – 16 = 84).

However, if those same 100 people each tightly control their BP over the 8 years of the study:

- About 5 people will be 'saved' from dying from diabetes complications (the **yellow** faces).
- About 84 people will not die from diabetes complications — but would not have done even if they had not tightly controlled their BP (the **green** faces).
- About 11 people will still die from diabetes complications, even though they tightly controlled their BP (the **red** faces).

But remember

- It is impossible to know for sure what will happen to each individual person.
- All 100 people will have to tightly control their BP for 8 years, and some of them will get side effects from the BP-lowering medication.



Tight control of BP — stroke

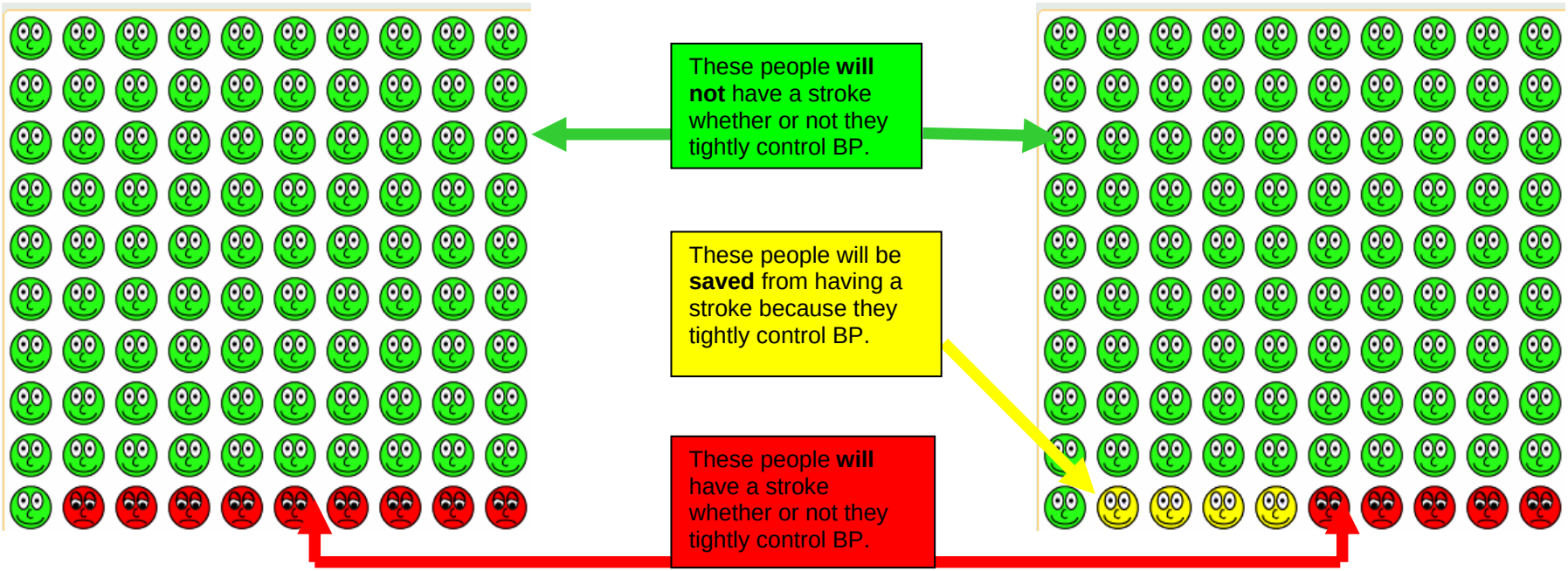
Imagine 100 people like those in this part of UKPDS. Without tight control of their BP about 9 (9%) of them would have a stroke over the next 8 years. So, 91 (91%) of them would not have a stroke (100 – 9 = 91).

However, if those same 100 people each tightly control their BP over the 8 years of the study:

- About 4 people will be 'saved' from having a stroke (the **yellow** faces).
- About 91 people will not have a stroke — but would not have done even if they had not tightly controlled their BP (the **green** faces).
- About 5 people will still have a stroke even though they tightly control their BP (the **red** faces).

But remember

- It is impossible to know for sure what will happen to each individual person.
- All 100 people will have to tightly control their BP for 8 years, and some of them will get side effects from the BP-lowering medication.



Control of BP — microvascular complications

Imagine 100 people like those in this part of UKPDS. Without tight control of their BP about 14 (14%) of them will have a microvascular complication, eg need retinal photocoagulation, over the next 8 years. So, 86 (86%) of them would not have a microvascular complication (100 – 14 = 86).

However, if those same 100 people each tightly control their BP over the 8 years of the study:

- About 5 people will be 'saved' from having a microvascular complication (the **yellow** faces).
- About 86 people will not have a microvascular complication — but would not have done even if they had not tightly controlled their BP (the **green** faces).
- About 9 people will still have a microvascular complication, even though they tightly control their BP (the **red** faces).

But remember

- It is impossible to know for sure what will happen to each individual person.
- All 100 people will have to tightly control their BP for 8 years, and some of them will get side effects from the BP-lowering medication.