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Carbs and Carb Counting

At the September meeting our discussion group looked at how we count carbohydrates, how quickly they are broken down before entering the bloodstream as glucose, and the practical ways in which we adjust our insulin to match both. Here's a summary of our discussions which, as always, should be taken as a record of what we've shared and not medical advice.

1. How we count carbs

Precision Counting

As near as possible accurate carb counting is the foundation of mealtime insulin dosing. For precise carbohydrate counting we use food labels (total carbohydrate figure, not 'of which sugars'), apps like Carbs and Cals or Nutracheck, careful measurement including traditional and digital food scales/measuring implements and, for some of us, targeted diabetes management courses, such as DAFNE to understand our insulin to carbohydrate ratios, extending bolus doses and how to tackle the extra impact of fat and protein on our blood glucose levels.

Estimating Carbs

'Tools' we use when out and about or can't access accurate carb data (and yes, also on those occasions when we just can't be bothered ☺). These include eye-balling portion sizes and estimating carb value or using mental units of carbohydrate measurement like a slice of bread or clenched fist.

2. Carb release times

By way of a quick reminder, carbohydrates are ranked by glycaemic index (GI), a measure of how quickly a food raises blood glucose.

Release type	Blood glucose impact	Window	Examples
Fast (high GI)	Sharp, immediate rise. Vital for treating hypos, harder to match at meals	0 to 15 mins	Lucozade Energy, Jelly Babies, glucose tablets, fruit juice, white jasmine rice
Medium (medium GI)	Moderate, steady rise. Standard pre-bolus timing usually works	30 to 60 mins	Wholemeal bread, basmati rice, Shredded Wheat, jacket potato, couscous
Slow (low GI)	Gradual, prolonged release	1 to 3+ hours	Porridge oats, lentils, chickpeas, beans, sweet potato, rye bread, pearl barley

Additional factors can also delay or speed up blood glucose rises:

- Fibre - soluble fibre slows stomach emptying and can turn a medium food into a slower one
- Fat and protein - eaten with carbohydrate, can delay digestion and push the glucose rise hours later
- Cooking and ripeness – longer cooked food and ripe fruit release faster than shorter cooking time and less ripe versions – al dente pasta and just ripening bananas for the win!
- Individual sensitivity - how your body responds to different types of carbohydrate and your individual insulin sensitivity/resistance. This varies from person to person, from day to day and can be impacted by other factors such as hormones, exercise, weather, stress etc.

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3. Ways to manage carb release times

We looked at some of the ways we use to manage carbohydrate release times.

- Pre-bolusing times - for medium and fast carbs, injecting rapid-acting insulin 15 to 20 minutes before eating can give the insulin a headstart but best avoided for those of us who are very sensitive to insulin. Also, bear in mind that if glucose levels are already low or falling, it's safer to bolus as you eat or just after.
- Adjusting our insulin to carbohydrate ratio to manage the effects of exercise, hormonal changes, weather, stress etc on our usual carbohydrate absorption/insulin sensitivity
- Cooking pasta, rice or potatoes, cooling them fully in the fridge and reheating creates resistant starch, which lowers their GI and helps some of us flatten the post-meal rise.
- Trying different food 'structure' – overcooking, mashing or blending breaks down cell walls and speeds up increase in blood glucose. Eating whole foods (eg a baked potato rather than mash) or cooking pasta al dente usually results in a slower rise.
- Combining higher GI carbs with fat, protein and fibre – eg, adding nuts and seeds to a bowl of cereal or chicken to a white rice dish again slows down the blood glucose spike
- For those on MDI, splitting your bolus dose for fatty or complex meals (ie, giving some of the dose up front and the remainder two to three hours later) can help avoid an early hypo and late spike.
- For those on pumps, an extended or dual-wave bolus where the dose is spread over several hours helps match glucose absorption to carbohydrate release.
- Exercise – eg, a brisk walk or half an hour playing in the garden post eating can lessen a sudden rise in blood glucose (also useful for managing expected and unexpected glucose spikes, eg the morning foot to floor syndrome or an accidental carbohydrate miscalculation!)
- Portion sizes – not what we always want to hear but smaller portions of starchy carbohydrates can help keep the glycaemic load low
- In some cases, switching to an ultra-rapid insulin, such as Fiasp has helped manage post meal spikes. However, its use in many pumps is off-label and, whether you are on mdi or a pump, must be discussed and agreed with your diabetes team.

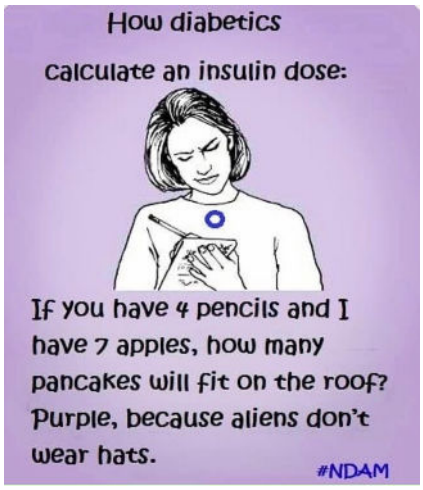
4. Managing insulin adjustments

While we all admit to having days where we're a bit more, err, 'casual' in our diabetes management (a lot of us definitely enjoyed the culinary delights of our summer holidays!), we all know that understanding our individual insulin requirements and how to adjust them to match the food we're eating is key to achieving better long-term time in range and HBA1C targets. And carbohydrate counting is only part of the picture. We talked about other factors that can affect absorption of carbohydrate and increase or reduce our sensitivity to insulin:-

- Exercise – aerobic exercise such as walking or cycling usually lowers glucose levels so extra carbs or a lower insulin dose (either bolus or basal) may be needed. Anaerobic exercise such as weights or sprinting can raise blood glucose and reduce sensitivity to insulin because of the release of stress hormones so extra insulin may be needed.
- Stress and illness – both can increase insulin resistance and often call for temporary increases in basal and bolus or correction doses.
- Hormones and hot weather also change how much insulin is needed and, depending on how you as an individual reacts, may require and increase or decrease in usual insulin doses.

5. Summary: you can't get it right all the time

Carb counting and insulin timing involves estimates at every step: the portion, the carb value, the release speed and how you respond that day. Even with careful counting, some meals will not go to plan, as anyone living with type 1 knows. The aim is steady improvement in patterns and time in range over weeks, not a perfect line after every meal. And just remember on those days when none of it seems to add up, you're not alone!



NB If you haven't already attended a DAFNE course and think it would help or would like to have a refresher session, please talk to your diabetes team. If you attend Bedford or L&D Hospitals and would like us to ask on your behalf, let us know.