Making the Most of Meter Data

By Gary Scheiner MS, CDE

Back in the 1960s, The Beach Boys released a hit song about the "plight" of American teens, called "Wouldn't It Be Nice." Those of us who treat and educate people with diabetes have our own forms of plight. One involves the preparedness (or lack thereof) of our patients when they come in for a visit. *Wouldn't it be nice* if everyone showed up with a complete written account of blood sugars, food intake, physical activities and insulin/medication doses since their last visit? And *wouldn't it be nice* if those records were always neat, organized and accurate?

We could go on and on, just wishing, and hoping, and thinking, and praying (lyrics from Dusty Springfield, also in the 1960s), but the fact is that good record keeping is becoming all the more scarce. The next time someone shows up with another "my dog ate my records" excuse, rather than playing the blame game, reach for the next best thing: their blood glucose meter. Virtually all modern meters are downloadable to a PC running in a Windows environment. The meters attach a time and date stamp to each blood glucose value so that graphs, charts and statistics can be generated. Of course, it helps if the meter's clock and calendar are set properly, so check these before doing a download.

A few select meters allow patients to enter management details such as carbohydrate intake, insulin/medication doses, and exercise. Others have event markers such as pre/post meal, illnesses or dining out. However, very few people who own these advanced meters make full and consistent use of these features, so let's focus on downloading blood glucose data only.

Setting Up Your System

Meter downloading software and cables are available free of charge to most healthcare providers. Special "healthcare" or "clinic" versions of the software allow for downloading, storing and analyzing aggregate patient files; the consumer versions have fewer capabilities. Just ask your manufacturer's representative or call the company directly using the toll-free number on the back of the various meters. Sales reps will usually assist you in installing the software and making sure the system is working properly.

Below is a summary of the equipment to ask for:

Meter Maker	Meter Type	Software	Download Apparatus
Lifescan/One Touch	Ultra, Ultra 2, Ultra Smart, Ultra Mini, UltraLink	One Touch DMS Pro	USB or 9-Pin Cable
Bayer/Ascensia	Contour, Dex, Breeze, Elite XL	WinGlucofacts Professional	USB or 9-Pin Cable
BD	BD Logic, Paradigm Link	BD InterActiv	USB or 9-Pin Cable
Roche/AccuChek	Advantage, Aviva, Compact, Complete, Instant	Pocket Compass	Infrared Reader
Abbott/Freestyle	Freestyle, Flash, Freedom, Lite, Precision Xtra, Cozmonitor	CoPilot Health Management System	USB or 9-Pin Cable (Infrared Reader for Cozmonitor)
Home Diagnostics	Prestige	Track Record DMS	USB or 9-Pin Cable

The Lowdown from the Download

Each software package offers its own unique set of reports. Most allow you to customize important factors such as the patient's target blood glucose range and typical meal/snack times. Of the multitude of reports that can be generated, I find a few particularly helpful:

The **Standard Day** or **Modal Day** report provides a scatter plot of blood glucose values arranged by time of day. It provides a quick visual summary of the quality of a person's blood glucose control at various mealtimes. Are there frequent highs or lows at certain times of day? Are the readings consistent or widely scattered?
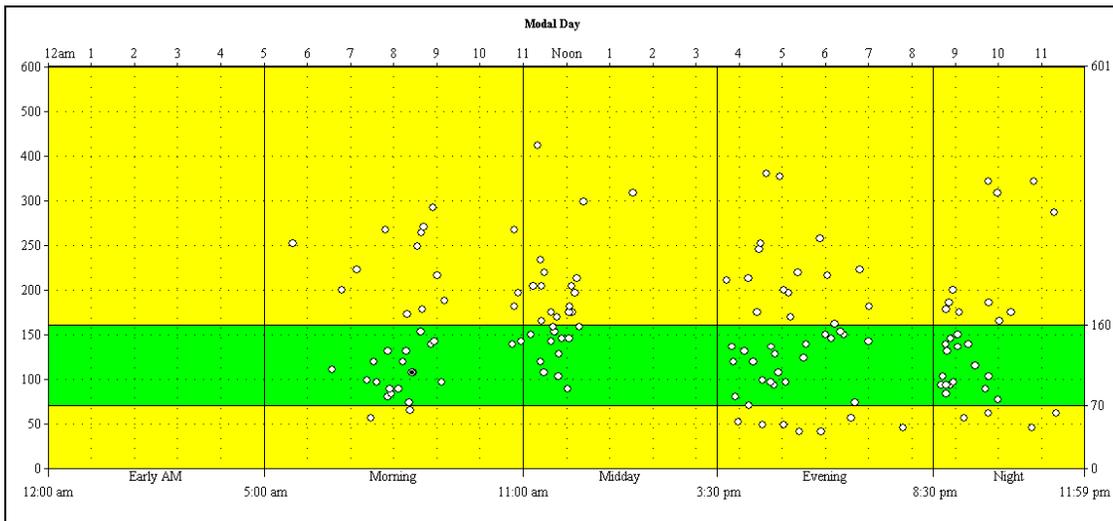
Example 1: Modal Day report from WinGlucofacts Pro (Bayer/Ascensia)

Along with the Standard/Modal Day, a **Statistical Summary** can be quite useful. Statistical reports usually include glucose averages, standard deviations and percentage of values above, below and within the target range. They may also allow a breakdown of these values by time of day or day of the week. Stats provide a good measure of progress from visit to visit, and help to document areas of strength and weakness.

Statistics Report
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Glucose Statistics (mg/dL)	Breakfast		Lunch		Dinner		Bed & Sleep		
	Pre	Post	Pre	Post	Pre	Post	Bed	Sleep	Total/Summary
# Readings	7	8	31	13	16	4	30	4	113
# Days w/Readings	7	8	26	13	15	4	24	4	31
Avg. # Readings/day	0.2	0.3	1.0	0.4	0.5	0.1	1.0	0.1	3.6
Highest	226	152	289	206	225	419	310	260	419
Lowest	71	98	65	116	112	141	79	117	65
Average	127	119	153	152	160	240	182	200	162
Standard Deviation	48.9	14.6	52.0	32.5	35.6	106.0	56.5	57.1	56.4
Above %	14	0	23	31	31	75	37	50	29
Within %	86	100	74	69	69	25	63	50	70
Below %	0	0	3	0	0	0	0	0	1

Example 2: Statistics Report from CoPilot Software (Abbott)

Glucose Trend Graphs provide a longitudinal plot of blood glucose values over an extended period of time, such as a month or several months. By highlighting periodic peaks and valleys, these graphs can help determine whether therapy adjustments are needed for factors such as weekends versus weekdays; pre- versus post-menstrual cycles; or variations in seasonal activity. Trend graphs are also useful for illustrating glycemic changes over prolonged periods of time.
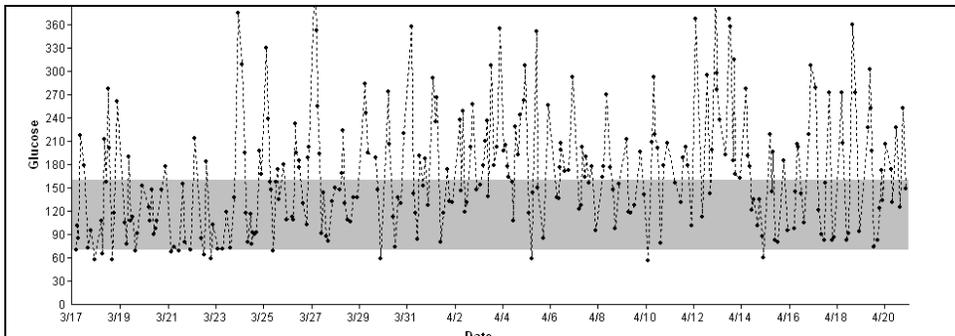
Example 3: Glucose Trend Graph from One Touch DMS Pro (Lifescan/J&J)

Editor's Note: Gary Scheiner is a Certified Diabetes Educator with a private practice, Integrated Diabetes Services, near Philadelphia. He and his staff provide management and education services for people with diabetes throughout the world via phone and Internet. For more information, write to Gary at gary@integrateddiabetes.com, or call (877) 735-3648.