

Insulin Therapy in Type 2 Diabetes Mellitus: History Drives Patient Care Toward a Better Future

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"Insulin will never be a success in the treatment of diabetics without the aid of the general practitioner."¹

These words, written by Elliott P. Joslin, MD, in 1923, still ring true today. After the first successful insulin injection was administered on January 23, 1922, to Leonard Thompson, a 14-year-old patient with type 1 diabetes mellitus at Toronto General Hospital, it did not take long before a diabetes clinic using insulin treatment was set up.² Insulin was subsequently provided to physicians in the United States for clinical trials, although many US patients with diabetes mellitus presented themselves to Sir Frederick Banting, MD, co-discover of insulin, in Toronto for insulin treatment. Within 2 years, insulin was being manufactured by multiple pharmaceutical companies and was available commercially in both the United States and Canada.² Almost immediately, health care professionals and others identified the problem of who was going to care for all of these patients. Patients were arriving at diabetes clinics expecting to receive insulin, often overwhelming the few physicians who were educated on the care of diabetic patients. For this reason, the physicians and nurses at the New England Deaconess Hospital in Boston initiated a teaching program so that general practitioners could learn all aspects of the management of diabetes.¹

Newspaper articles and scientific publications reported children recovering from what was invariably a fatal disease just a year prior. Insulin was regarded as a miracle, and many patients were being referred to specialized clinics for insulin treatment. However, 90% of patients with diabetes seen at the Massachusetts General Hospital clinic in 1923 did not appear to

need insulin immediately.¹ Whether these patients had type 2 diabetes mellitus is a matter of speculation. As insulin was scarce, it was being administered to the patients in the most dire of circumstances at that time. Patients spent a substantial amount of time in the hospital learning how to administer insulin, prepare their food, and test their urine for glucose. As early as 1925, this practice was recognized as expensive and led to a shortage of available hospital beds.³ The major issues in the 1920s were how to identify which diabetic patients required insulin, what was the best way to initiate insulin therapy, and how to titrate the insulin while improving the health of the patient and avoiding hypoglycemia. Despite the improvements in diabetes care during the past 90 years, health care providers continue to struggle with these same questions. In this supplement to *The Journal of the American Osteopathic Association*, Jay H. Shubrook Jr, DO, provides answers in the form of patient cases, with evidence-based discussions and clinical advice on insulin initiation and intensification of therapy.⁴

Interesting parallels may also be drawn between the advice of nearly 90 years ago and today. Insulin was advised for thin patients or those who appeared to be in a catabolic state, those patients who were younger than 40 years, all patients with acidosis, and patients with infection or requiring a surgical procedure.³ In her article, Allison Petznick, DO, provides up-to-date guidance regarding indications for insulin therapy, as well as goals for glycemic control, by using a patient-centered approach.⁵

In the 1920s, patients were advised that insulin did not cure diabetes, that it was administered with a needle, and that they needed lifelong therapy.³ Today, patients with type 2 diabetes mellitus experience fear regarding insulin initiation as a result of advice they may have received from their friends, relatives, and physicians. They worry that they cannot be cured or that their condition is worsening; some have needle phobia, and others ask if they may discon-

tinue insulin when their glucose control improves. Dr Petznick gives physicians insight into how to improve communication with their patients on these concerns. Both Dr Petznick and Joseph M. Tibaldi, MD, provide additional information on the use of insulin in patients with newly diagnosed type 2 diabetes mellitus to achieve improvement in β -cell functioning, possibly allowing the patient to transition to oral agents and discontinue insulin.^{5,6}

The availability of oral agents in the mid-1950s brought a greater willingness on the part of the patient with diabetes to seek medical care.⁷ Screening programs had already been in place for more than a decade, and it was being recognized that early treatment and control appeared to reduce the incidence of diabetes complications.⁸ As a consequence of the results of the University Group Diabetes Program, as well as the propensity for phenformin to cause lactic acidosis, the use of oral agents declined somewhat during the 1970s.⁹ The 1980s brought improvements in sulfonylureas, subsequently increasing their use once again, but in the mid-1990s an explosion of new antidiabetic agents with myriad mechanisms of action occurred in the United States. At the same time, insulin therapy continued to improve, with the introduction of more physiologic insulins. As physicians, it is our responsibility to educate patients on how to use insulin to more closely mimic normal physiologic conditions. Dr Shubrook and Dr Tibaldi describe how basal and bolus insulins are used in practice and how they may be prudently combined with other antidiabetic agents on the basis of synergy in their mechanisms of action and efficacy in control of glucose.^{4,6}

Insulin therapy in patients with type 2 diabetes mellitus is appropriate and is indicated in many cases. Care should be taken so that both the physician and the patient set reasonable expectations for glucose control when insulin is initiated. The expectations should be discussed and modified as the situation dictates. Patients are more knowledgeable about ther-

apies than ever before, and they want to discuss their understanding, as well as their apprehensions. While some fears may be related to the experiences of older friends or relatives who used insulin to manage their diabetes, others may be related to how the insulin will affect them, particularly regarding hypoglycemia or weight gain. Insulin therapy has changed a great deal in 90 years—more physiologic insulins, smaller needles, additional delivery options (pens, pumps, disposable mechanical devices)—that there are now many ways to work with patients to help them use insulin to achieve better glucose control.

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