Youth with diabetes are a special and unique group who challenge diabetes educators regularly. Wallis, for example, describes youth as “high-powered cars without skilled drivers” (1,2). While it has long been acknowledged that hormones can play a part in contributing to the sensation seeking, risk-taking, mood swings and sense of immortality so typical of adolescence, recent studies provide evidence that there are physiological reasons why youth think and act as they do.

A timely, comprehensive paper by Herrman provides a context for understanding that the adolescent brain truly is a work in progress (2). This editorial will focus in large part on this extensive and eloquent review.

Spano presents evidence that significant physiologic brain growth and cognitive development involving 3 distinct processes of nerve cell proliferation, pruning and hyalinization extends well into young adulthood (1,3). Considering the predictable course of brain development, along with other more familiar factors such as hormonal changes and environmental stimuli, expands the framework we have for understanding and addressing the unique thought processes and behaviours of youth.

In early adolescence, rear brain cells respond and are influenced by genetic, hormonal and environmental cues. Brain development in the early to middle teens governs functions such as self-control, judgement, emotions, multi-tasking, and goal-directed behaviours (1). Problematic cell development may contribute to poor decision-making, reckless behaviour and a tendency toward increased emotional outbursts (1,4). Rage and fear are common emotions during this stage of development.

During mid-adolescence, middle brain development—also known as the ‘secretary’ to the frontal brain—is in charge of organizing, setting priorities and keeping on task (1). It is the centre of problem solving, decision-making and the origin of creativity and critical thinking (1).

Frontal brain development, which is responsible for such rational, executive functions as organizing thoughts, weighing consequences and assuming responsibility, is thought to develop well into the 20s (1). Other predictable and expected factors of adolescent brain development are avoidance of and slower recovery from stressful stimuli, misreading of emotional and communication cues, and sleep deprivation.

Hockenberry refutes the theory that formal abstract thinking is complete by the age of 14 years (1,5). According to Sutherland, Neo-Piagetians contend that one-half of adolescents remain in the concrete operational thinking well into young adulthood (1,6). Thus, the underdevelopment of abstract thinking in youth has important implications for the way we teach them about diabetes.

This information lends credence to the theory that the late adolescent period does indeed extend to age 25. Interestingly, this re-definition of the adolescent period is beyond the scope of the World Health Organization (7) definition of adolescence ending at age 19. Any definition of adolescence may not take into consideration those youth who have learning disabilities, cognitive impairment, mental illness and developmental delays. This at-risk group—who grow into adulthood chronologically but not mentally or emotionally—warrants a whole area of discussion and research.
When the going gets rough in adolescence, both educators and youth can take reassurance and sustained energy in knowing that maturation is in progress and inevitable. There is indeed a future.

Hermann acknowledges the biologic differences between youth and adult brains (2). But how do we translate this theory into practice?

Teens grow and develop in many ways that warrant our understanding and care. Evolving cognitive functioning in abstract thinking, reasoning, weighing the costs and benefits of selected health behaviours, and the cause and effect of consequences all affect a youth’s response to diabetes education and present and potential behaviour change (2).

Hermann makes a case for parental involvement to decrease risk-taking behaviour and states that cognitive development is best "fostered within the boundaries of firm behavioural limits and structured discipline" (2). This approach is balanced by offering incremental opportunities for independence, decision-making and recovery from mistakes (1,2). Understanding the emotional lability, stress and immature self control of youth can help adults view confrontation as a learning opportunity rather than a power struggle. Progressive strides toward independence, and decision-making through encouragement and reward appear to be the best strategies for supporting task mastery. Listening to youth takes the form of appreciative and respectful inquiry identifying the best of 'what is' to reach the 'what could be' (8).

Spano suggests that these findings “add new dimensions” to educators, parents and policymakers. Insight into the physiologic processes of cognitive brain maturation is essential to the design of individually based, developmentally appropriate learning sessions (2).

Current data on brain maturation and the challenges of transition (9-12) further the need for us to advocate for young adult diabetes education programs. For all diabetes educators, an understanding of brain cell maturation and cognitive and behavioural processes in this developmental life stage is yet another tool to help us plan programs and policies to meet the diabetes needs of this puzzling and challenging group.

In this issue of Diabetes Quarterly:

- Janet Preston finds new ways of approaching and communicating with adolescents who have diabetes by using the telephone, an often overlooked tool (page 8).
- Catherine Puhl describes the success of the Multi-disciplinary Diabetes Complications Clinic at St. Michael’s Hospital, Toronto, Ontario (page 14).
- Gillian Toth reveals a correlation between youth with type 2 diabetes and smoking and sexual activity (page 6).
- Joelle Madill is an aspiring diabetes educator who has set her sights on making a difference in the lives of youth at risk for type 2 diabetes (page 13).
- Yvette Thomson uses an intensive assessment tool to teach people competency in foot self-care (page 12).
- Joanne Hamilton writes with excitement about a new CDA “Partner’s in Progress” initiative to be introduced at the CDA’s professional conference in October 2005 (page 4).

References