Incorporating New Technology Into Pediatric Diabetes Management: A Psychologist's Perspective

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Tough Questions For Diabetes Clinicians

- Who should benefit from technological advances in DM care?
- What criteria should be used for selecting patients for these opportunities?
- What can be done to optimize patients' benefits from new technologies?
- Are some patients unfairly deprived of new technologies that might benefit them?

Background

- **The family is the unit of treatment in pediatric diabetes.**
- **Key ingredients of effective family management of diabetes are:**
  - **Parent/child communication**
  - **Collaborative diabetes teamwork**
  - **Parental support and monitoring**
  - **Careful transfer of responsibility**
  - **Diabetes problem solving skills**

DirecNet Navigator Studies

- Pilot and feasibility studies of augmentation of intensified T1DM regimens with use the Abbott Freestyle Navigator continuous glucose monitor.
- 30 carefully selected children 7-<18 years old on insulin pump regimens.
- 27 carefully selected children 7-<18 years old on multiple daily injection regimens.
- One week “run-in” with blinded CGM use.
- Effects on qlycemic control, QOL, frequency of CGM use and satisfaction measured quarterly

13-Week Navigator results in CSII patients

- HbA_{1C} declined from 7.1% at baseline to 6.8% at 13 weeks. (p = .02)
- % Navigator readings between 70 and 180 mg/dl increased from 52% to 60%. (p = .01)
- Navigator use declined from 149 hrs/wk in wks 1-4 to 134 hrs/wk in wks 9-13 (p = .0006)
- Glycemic benefits greater for those with baseline HbA_{1C} > 7.0%

13-Week Navigator results in MDI patients

- HbA1C declined from 7.9% at baseline to 7.1% at 13 weeks. (p = .004)
- % Navigator readings between 70 and 180 mg/dl increased (46% to 55%) during first 8 weeks of use and then declined by week 13.
- Navigator use declined from 153 hrs/wk at baseline to 107 hrs/wk in wks 9-13 (p = .0006)
- Greater glycemic benefits among those with baseline HbA1C > 7.5%.

Navigator Study 26 week follow-up

- 45 of 57 patients continued (24 CSII; 21 MDI)
- Navigator use continued to decline to about 80 hrs/wk in both CSII and MDI patients.
- Glycemic benefits tapered off for CSII and MDI.
- Frequency of Navigator use was not predictable from baseline demographic or clinical factors.
- Frequency of Navigator use in weeks 1-4 was predictive of later frequency of use.
- Satisfaction with CGM use at 13 weeks also predicted frequency of CGM use at week 26.

Implications of the Navigator Study

- Despite careful sample selection and run-in period, frequency of Navigator use dropped steadily over 6 months.
- Glycemic benefits tend to dissipate over time.
- Patients with poorer glycemic control at baseline tended to enjoy more glycemic benefit from Navigator use.
- Few reliable predictors of frequency of Navigator use over 6 months.
- Methods of promoting use of CGMs may yield more benefit than efforts to select ideal candidates.

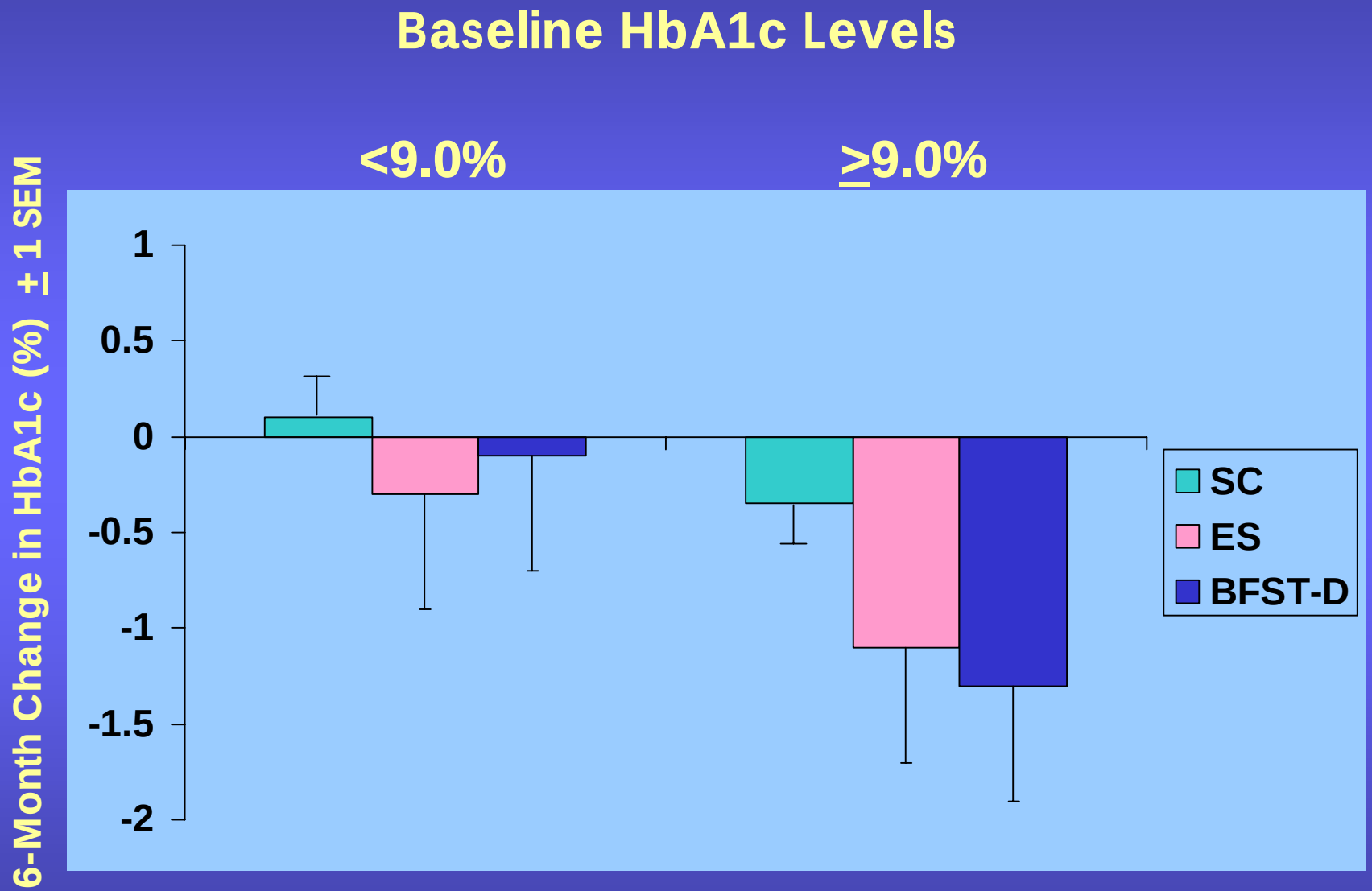
Behavioral Intervention Trials in Pediatric T1DM

- **Behavioral Family Systems Therapy** (Wysocki)
- **Multisystemic Therapy** (Ellis)
- **Family Teamwork trial** (Anderson & Laffel)
- **Coping Skills Training** (Grey)
- **Diabetes Self-Management Training** (Delamater)

Behavioral Family Systems Therapy

- Structured, individualized training in family communication and problem solving.
- Instructions, feedback, modeling and rehearsal.
- Behavioral homework assignments.
- 12 sessions over 6 months.
- Revised to enhance impact on adherence and glycemic control.
- 104 families of adolescents with HbA1c > 8%.

BFST Effects on HbA1c



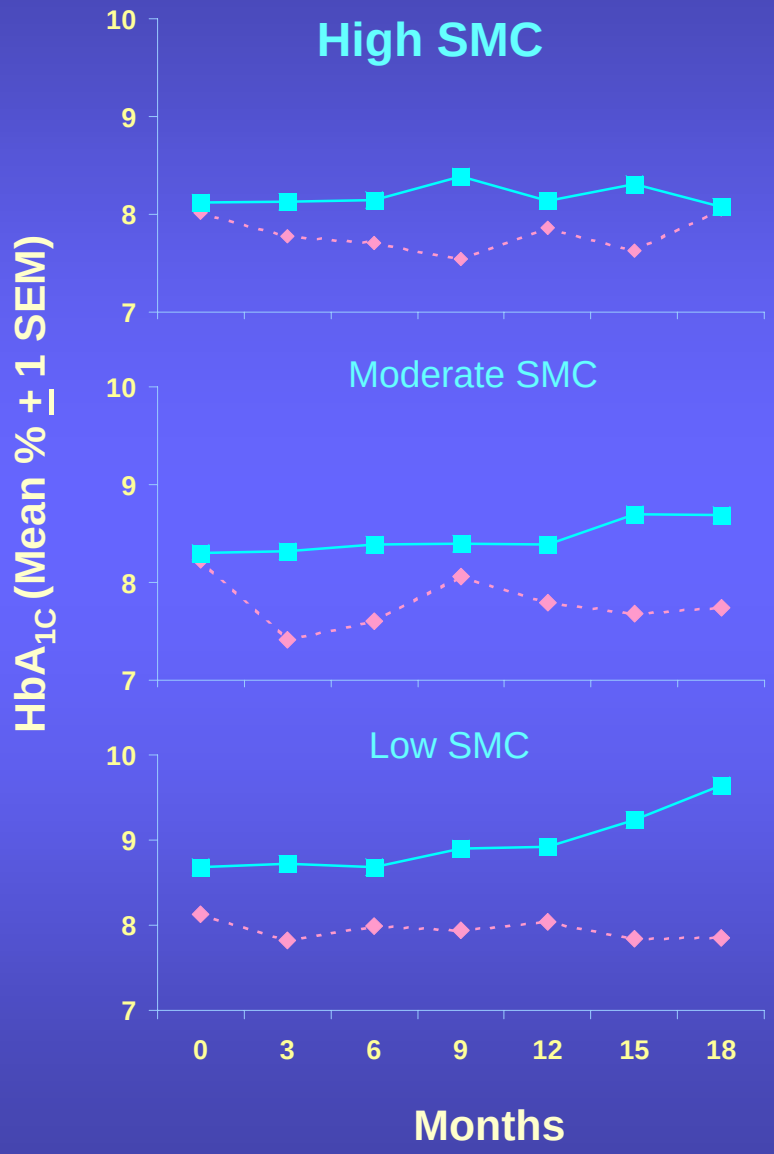
Wysocki, et al., Diabetes Care, 30, 555-560, 2007

Intensive Therapy for Youth

- **147 youth with T1DM (6-15 years of age) randomized to Intensive Therapy (IT) or Usual Care (UC) for 18 months.**
- **IT group received supportive services from a multidisciplinary team to facilitate family management of intensified therapy regimens.**
- **Emphasis in the study was on identifying predictors of benefit from the IT and UC regimens.**

Wysocki, et al., Diabetes Care, 26, 2043-2047, 2003

Intensive Therapy Effects on HbA1c as a function of baseline level of self management competence (SMC)



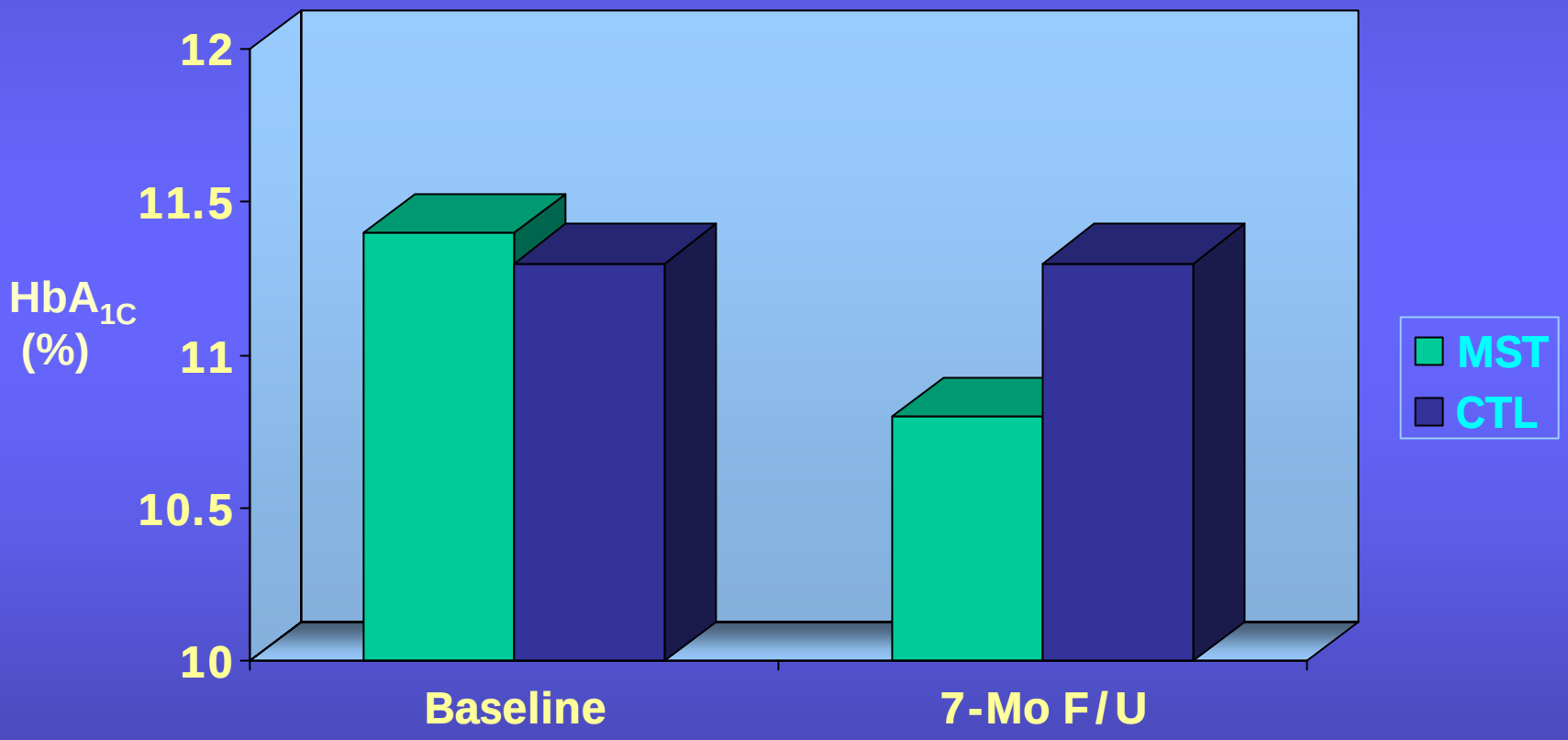
INTENSIVE THERAPY

USUAL CARE

Multisystemic Therapy

- Multisystemic Therapy (MST) was originally developed and validated as an intervention for families of delinquent and pre-delinquent youth.
- Similar to BFST except for much heavier emphasis on engagement of other pertinent systems in therapy (e.g. peers, school, church, health care team).
- Trial targeted urban adolescents with T1DM with HbA_{1C} > 9%.

Multisystemic Therapy: Effects on HbA_{1C}

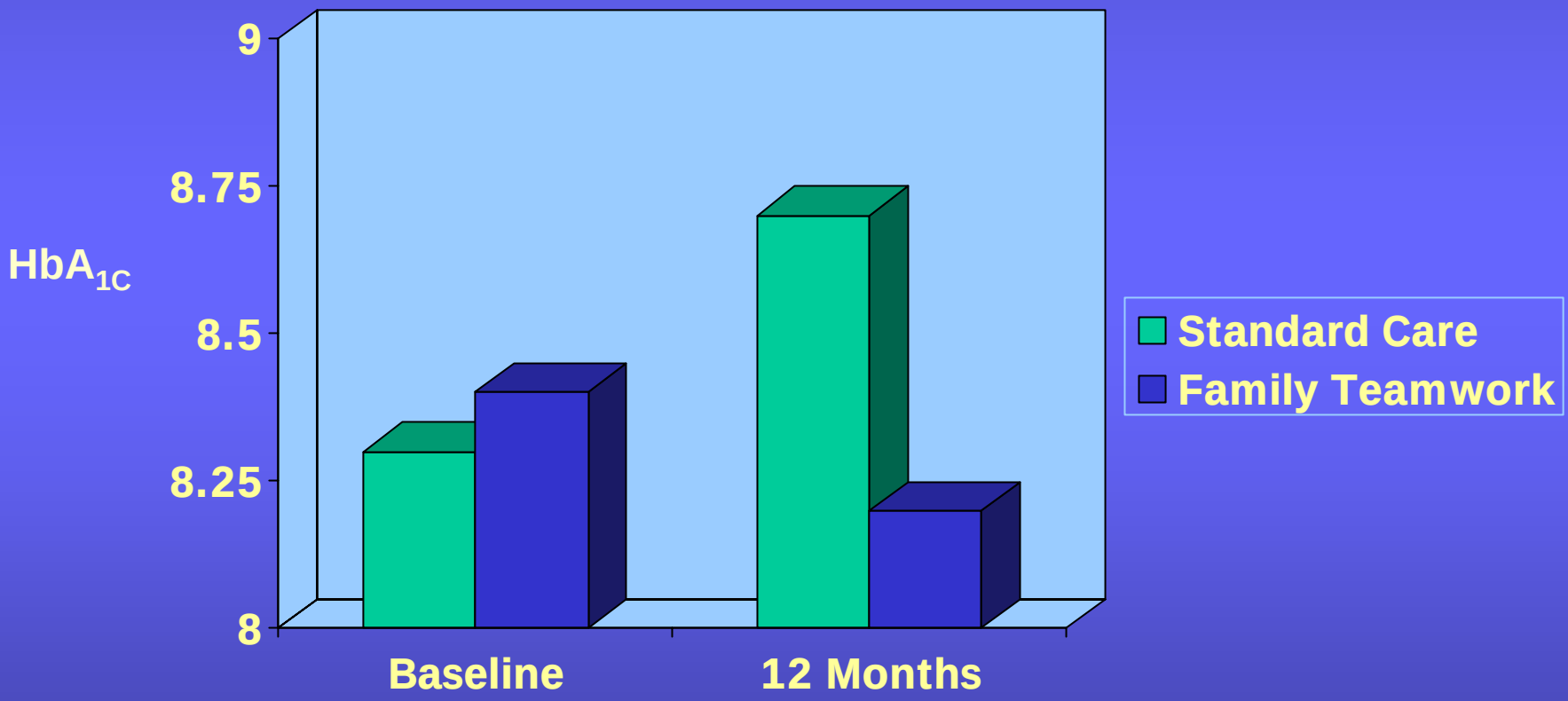


Ellis et al., J. Cons. Clin. Psychol., 75, 168-174, 2007

Family Teamwork Intervention

- Anderson, Laffel and colleagues at Joslin Diabetes Center randomized 100 families to standard care or family teamwork intervention.
- Low-intensity, family-focused intervention integrated with diabetes clinic visits.
- Intervention families received psychoeducational guidance and support from a college graduate who was not a mental health professional.

Family Teamwork Intervention Effects on HbA_{1C}

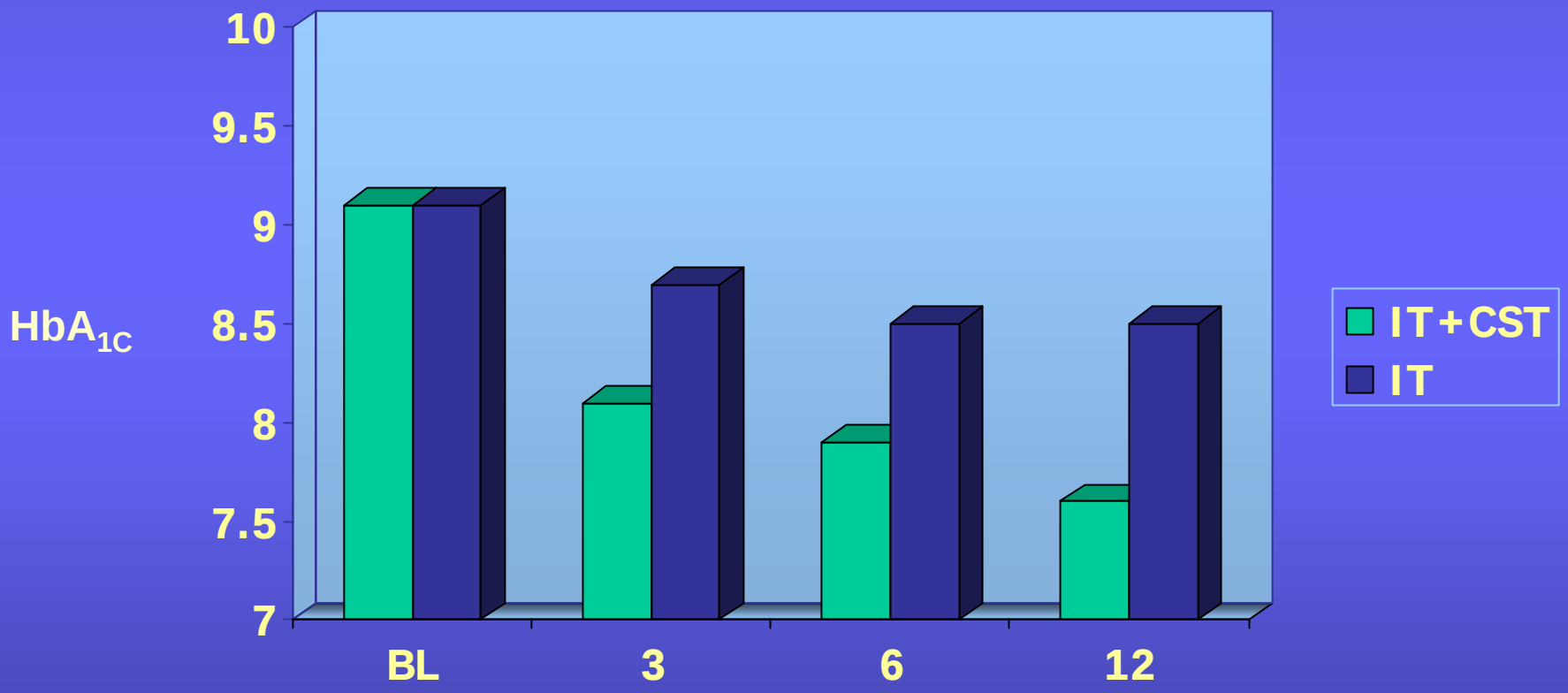


Laffel, et al., J. Pediatr., 142, 409-416, 2003

Coping Skills Training

- 77 adolescents with T1DM initiating intensive regimens were randomized to standard care (SC) or to coping skills training (CST) in a group setting.
- Structured curriculum supplemented with individualized behavioral homework assignments.
- Content included cognitive behavior therapy, social problem solving and conflict resolution.
- Evaluations at baseline and then 3, 6 and 12 months after intervention.

Intensified Therapy With and Without Coping Skills Training

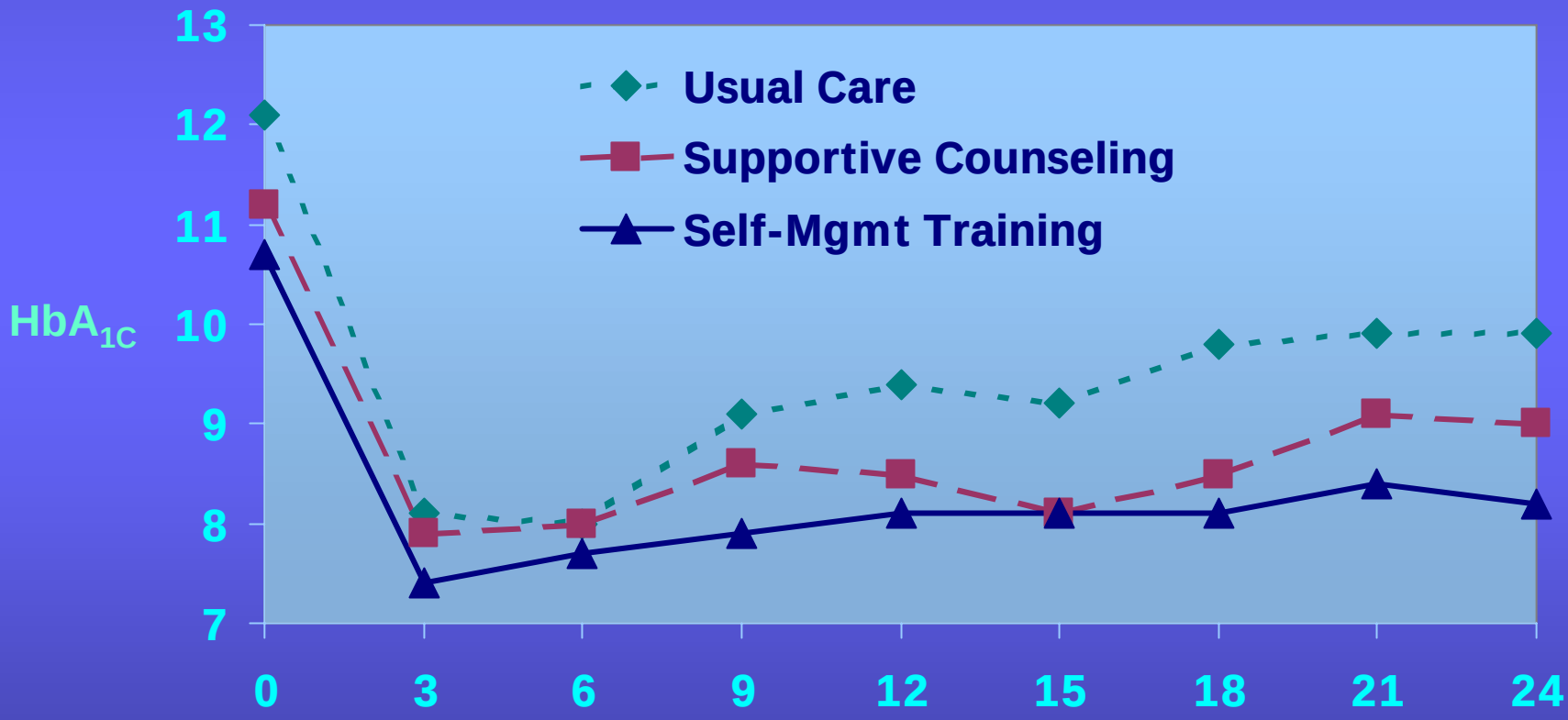


Grey et al. J. Pediatr. 137, 107-114, 2000

Diabetes Self Management Training

- Families of children and adolescents newly diagnosed with T1DM.
- Behavioral parent training curriculum adapted specifically to behavioral demands of T1DM.
- Emphasis on training parents and youth in active use of SMBG data for decision making.
- 6-month intervention with 2-year follow-up.

Diabetes Self Management Training Effects on HbA_{1C}

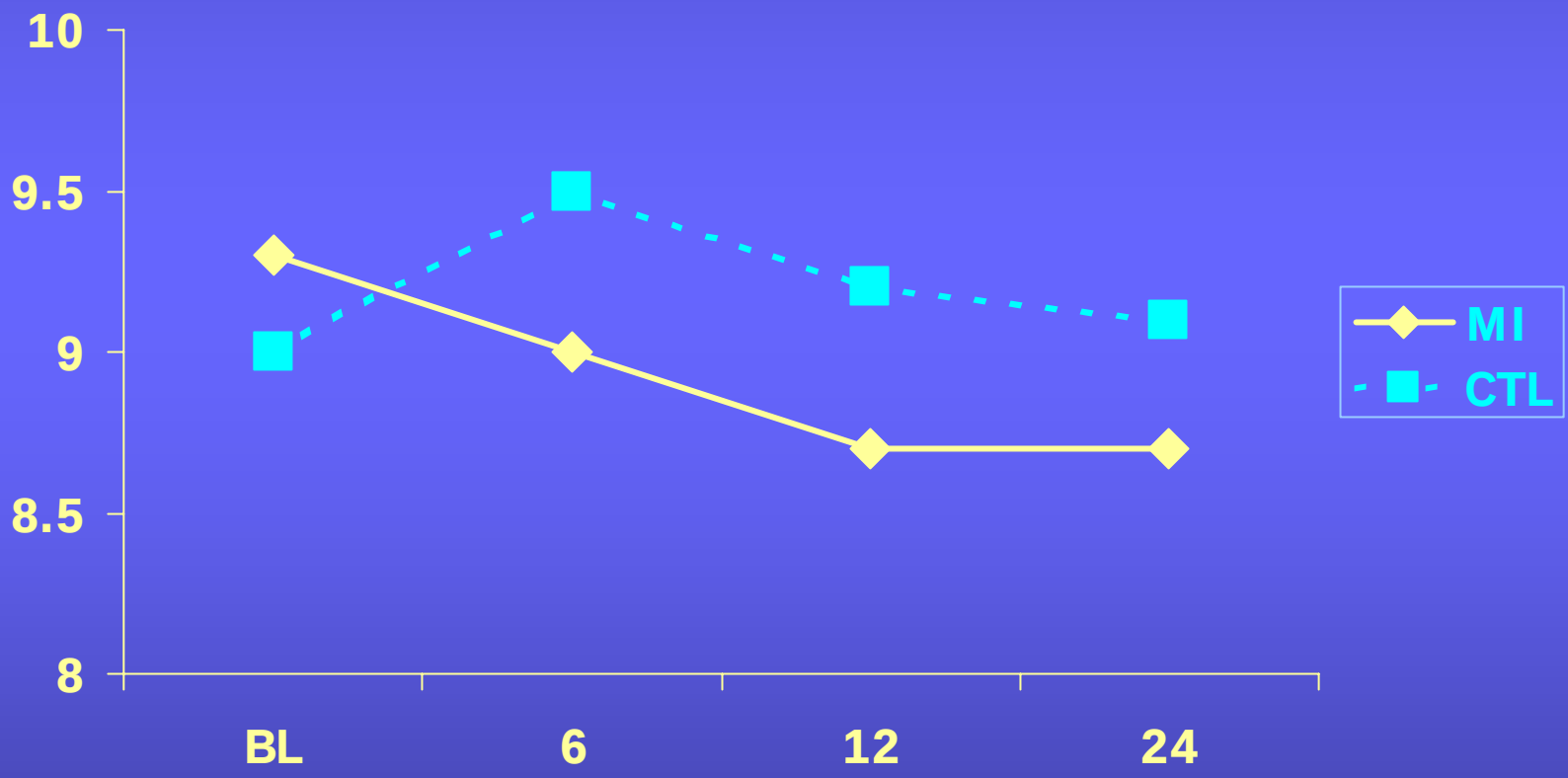


Delamater et al., Diabetes Care, 13, 241-253, 1990

Motivational Interviewing

- **Patient-centered approach designed to elicit self-change statements and encourage self-directed action toward behavior change.**
- **Key elements are:**
  - **Establishing rapport**
  - **Development of a discrepancy between patient's goals and current status**
  - **Exploration of alternatives to current behaviors**
  - **Problem solving and goal setting that are patient initiated.**

Randomized Trial of Motivational Interviewing in Adolescents with Diabetes



Channon et al., Diabetes Care,30, 1390-1395, 2007

Preliminary Conclusions

- Intensive family or individual psychological intervention can yield beneficial effects on diabetes outcomes.
- Patients with poor status before treatment often derive substantial benefits.
- Careful patient selection does not guarantee or perhaps even enhance benefit from therapeutic advances.
- Can behavioral interventions such as those reviewed here enhance benefit from adding new technologies to DM care?

Clinician Roles in Adopting New Diabetes Technologies

- Get CME on psychological aspects of DM.
- Provide a balanced view of new technology.
- Use a “system” for selecting candidates.
- Gain initial experience with “All Star” patients.
- Dedicate time and effort to proven behavior change strategies.
- Treat access to new technology as a privilege to be earned by better self-care.
- Some technological advances may encourage treatment adherence.

Read one of these books

- Rapoff, M. Adherence to Pediatric Medical Regimens. Springer, 1999.
- Christopherson, E. Pediatric Compliance: A Guide for the Primary Care Physician. Plenum Medical Books, 1994.
- Drotar, D. Promoting Adherence to Medical Treatment in Chronic Childhood Illness: Concepts, methods and Interventions Lawrence Erlbaum Assoc., 2000.

Thank You!