Making It Work: Lifestyle Strategies and Clinical Tools for Diabetes, Obesity and Atherosclerosis

Friday, May 6th, 2011

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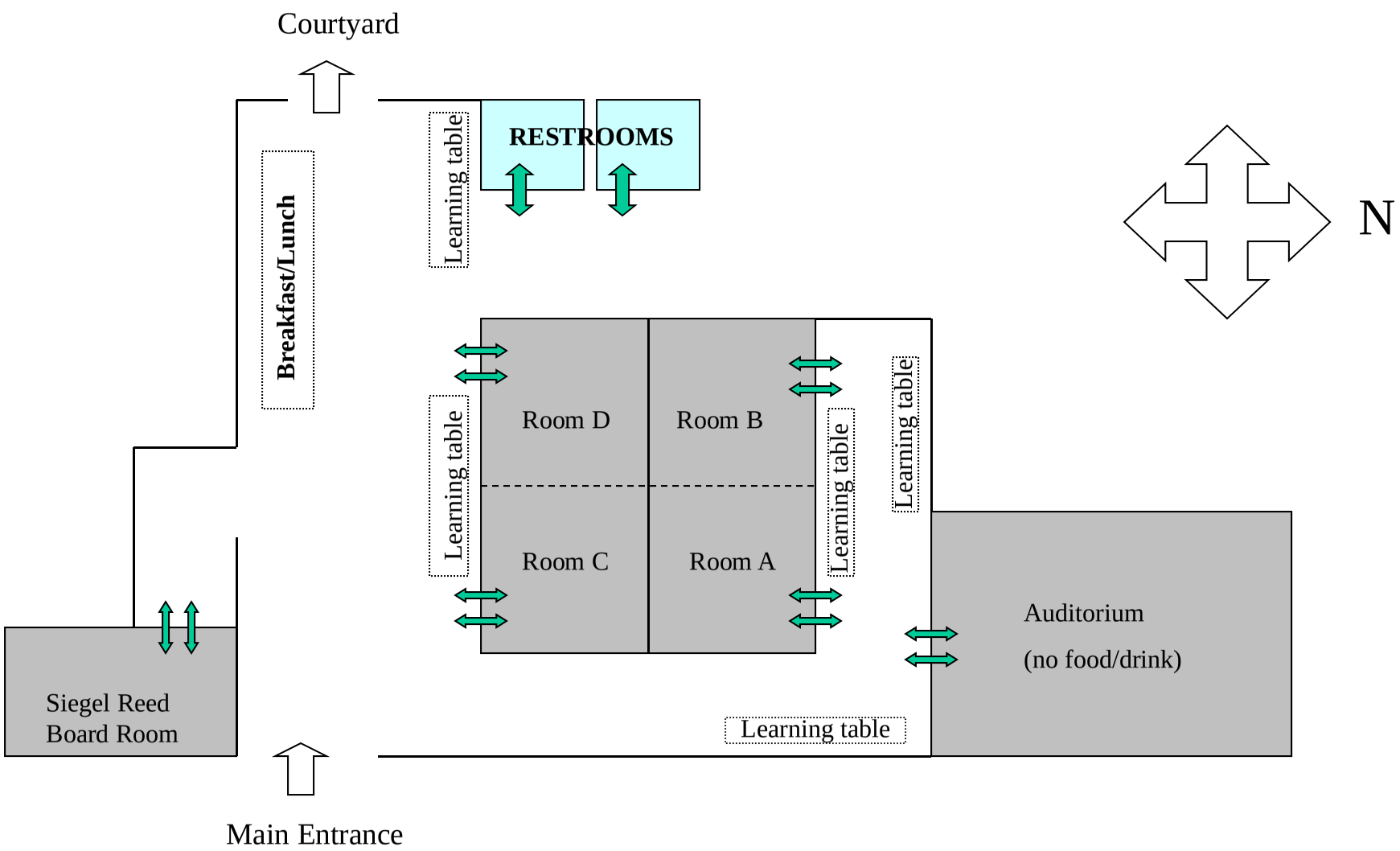
Additional low-literacy nutrition resources (free, downloadable, printable) are available at *www.learningaboutdiabetes.org*. These materials are available in both English and Spanish.	

Making It Work: Lifestyle Strategies and Clinical Tools for Diabetes, Obesity and Atherosclerosis

Friday, May 6, 2011
The J. David Gladstone Institutes
1650 Owens Street, San Francisco, CA

8:00 – 8:30	Registration/Breakfast
8:30 – 8:50	Welcome/Introductory Remarks *Elizabeth Murphy, MD, DPhil*
8:50 – 9:20	The Power of Therapeutic Lifestyle Change *Thomas Bersot, MD, PhD*
9:20 – 10:10	Practical Nutrition in the 15-minute Office Visit *Mikelle McCoin, MPH, RD*
10:10 - 10:30	New Diabetes Tools and Resources *Elizabeth Murphy, MD, DPhil*
10:30 - 10:45	BREAK
10:45 – 11:45	Concurrent sessions: a) How Low to Go? What are the Appropriate Glycemic Targets in Diabetes? b) *Elizabeth Murphy, MD, DPhil* c) Supporting Your Patients: Moving from oral agents to insulin (Hands-on Learning) *Amalia Fyles, RN, MSN, CNS, CDE, Elissa Hallen, RN, CDE, Charlotte Kuo, NP, and Audrey Tang, FNP*
11:45 – 12:45	LUNCH HOUR
12:45 – 1:30	Breakout sessions a) Motivational Interviewing. *Susan Scheidt, PsyD* b) Thinking Outside the Box: Beyond the traditional 1:1 patient visit *David Lown, MD* c) Improving Panel Management: Using your data. *Elizabeth Johnson, MD, and Lisa Golden, MD* d) Development of the DM RN Care Manager Role. *Amalia Fyles, RN, MSN, CNS, CDE, and Elissa Hallen, RN, CDE*
1:30 – 2:00	Clinic groups meet: Formulating action plans.
2:00 – 2:45	Making the Most of SMBG. *Lawrence Fisher, PhD*
2:45 – 3:00	Psychological Insulin Resistance: Addressing barriers. *Amalia Fyles, RN, MSN, CNS, CDE*
3:00 – 3:50	Hormone Replacement Therapy… Insulin, is it for everybody? *Kim Higgins, RN, CDE*
3:50 – 4:10	Applying the Insulin Algorithm *Suneil Koliwad, MD, PhD*
4:10 – 4:20	Closing *Elizabeth Murphy, MD, DPhil*



Making It Work – Friday, May 6th, 2011

The J. David Gladstone Institutes

1650 Owens Street

Acknowledgement of Support

Educational Grants

San Francisco General Hospital Foundation Hearts Grant

Kaiser Permanente Community Benefit

UCSF University of California, San Francisco School of Medicine Presents

Making It Work: Lifestyle Strategies and Clinical Tools for Diabetes, Obesity, and Atherosclerosis

Educational Objectives

Upon completion of this program, attendees should be able to:

- Improve practice by applying early intervention and prevention strategies to reduce complication, morbidity, and mortality for diabetes, obesity and atherosclerosis;
- Define treatment guidelines and understand medication algorithms aimed at timely achievement of target goals;
- Understand the indications and strategies for safe, appropriate, and timely initiation of insulin;
- Utilize skills and strategies for improving behavioral change counseling interventions during a typical office visit.

Accreditation

The University of California, San Francisco School of Medicine (UCSF) is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

UCSF designates this live activity for a maximum of *6 Category 1 Credits*™ toward the AMA Physician's Recognition Award. Each physician should claim only those credits that he/she actually spent in the activity.

General Information

Certificates
Please return your Attendance Verification Record (AVR) form by the end of the course along with your evaluation. Certificates will be mailed to you, at the address you registered with, in two-four weeks.

Please note you will find an hour by hour credit calculation on the back of the AVR.

Evaluation
Your opinion is important to us. Please complete and return the course evaluation as it is important to future course planning. Please turn in the evaluation with your AVR.

Security
We urge caution with regard to your personal belongings and syllabus books. We are unable to replace these in the event of loss. Please do not leave any personal belongings unattended in the meeting room during lunch or breaks or overnight.

Tables
Educational tables will be available outside the auditorium during breakfast, breaks, and lunch.

Presentations
PowerPoint presentations will be available on our website, www.cme.ucsf.edu, approximately 2-4 weeks post event. We will only post presentations for those authorized by the presenters.

General Information
Please note that the J. David Gladstone Institutes does not allow food or drink in the auditorium, including water.

Food and drink are allowed in classrooms A, B, C, D.

Federal and State Law
Regarding Linguistic Access and Services for Limited English Proficient Persons

I. Purpose.

This document is intended to satisfy the requirements set forth in California Business and Professions code 2190.1. California law requires physicians to obtain training in cultural and linguistic competency as part of their continuing medical education programs. This document and the attachments are intended to provide physicians with an overview of federal and state laws regarding linguistic access and services for limited English proficient ("LEP") persons. Other federal and state laws not reviewed below also may govern the manner in which physicians and healthcare providers render services for disabled, hearing impaired or other protected categories

II. Federal Law – Federal Civil Rights Act of 1964, Executive Order 13166, August 11, 2000, and Department of Health and Human Services ("HHS") Regulations and LEP Guidance.

The Federal Civil Rights Act of 1964, as amended, and HHS regulations require recipients of federal financial assistance ("Recipients") to take reasonable steps to ensure that LEP persons have meaningful access to federally funded programs and services. Failure to provide LEP individuals with access to federally funded programs and services may constitute national origin discrimination, which may be remedied by federal agency enforcement action. Recipients may include physicians, hospitals, universities and academic medical centers who receive grants, training, equipment, surplus property and other assistance from the federal government.

HHS recently issued revised guidance documents for Recipients to ensure that they understand their obligations to provide language assistance services to LEP persons. A copy of HHS's summary document entitled "Guidance for Federal Financial Assistance Recipients Regarding Title VI and the Prohibition Against National Origin Discrimination Affecting Limited English Proficient Persons – Summary" is available at HHS's website at: http://www.hhs.gov/ocr/lep/ .

As noted above, Recipients generally must provide meaningful access to their programs and services for LEP persons. The rule, however, is a flexible one and HHS recognizes that "reasonable steps" may differ depending on the Recipient's size and scope of services. HHS advised that Recipients, in designing an LEP program, should conduct an individualized assessment balancing four factors, including: (i) the number or proportion of LEP persons eligible to be served or likely to be encountered by the Recipient; (ii) the frequency with which LEP individuals come into contact with the Recipient's program; (iii) the nature and importance of the program, activity or service provided by the Recipient to its beneficiaries; and (iv) the resources available to the Recipient and the costs of interpreting and translation services.

Based on the Recipient's analysis, the Recipient should then design an LEP plan based on five recommended steps, including: (i) identifying LEP individuals who may need assistance; (ii) identifying language assistance measures; (iii) training staff; (iv) providing notice to LEP persons; and (v) monitoring and updating the LEP plan.

A Recipient's LEP plan likely will include translating vital documents and providing either on-site interpreters or telephone interpreter services, or using shared interpreting services with other Recipients. Recipients may take other reasonable steps depending on the emergent or non-emergent needs of the LEP individual, such as hiring bilingual staff who are competent in the skills required for medical translation, hiring staff interpreters, or contracting with outside public or private agencies that provide interpreter services. HHS's guidance provides detailed examples of the mix of services that a Recipient should consider and implement. HHS's guidance also establishes a "safe harbor" that Recipients may elect to follow when determining

whether vital documents must be translated into other languages. Compliance with the safe harbor will be strong evidence that the Recipient has satisfied its written translation obligations.

In addition to reviewing HHS guidance documents, Recipients may contact HHS's Office for Civil Rights for technical assistance in establishing a reasonable LEP plan.

III. California Law – Dymally-Alatorre Bilingual Services Act.

The California legislature enacted the California's Dymally-Alatorre Bilingual Services Act (Govt. Code 7290 *et seq.*) in order to ensure that California residents would appropriately receive services from public agencies regardless of the person's English language skills. California Government Code section 7291 recites this legislative intent as follows:

> "The Legislature hereby finds and declares that the effective maintenance and development of a free and democratic society depends on the right and ability of its citizens and residents to communicate with their government and the right and ability of the government to communicate with them.
>
> The Legislature further finds and declares that substantial numbers of persons who live, work and pay taxes in this state are unable, either because they do not speak or write English at all, or because their primary language is other than English, effectively to communicate with their government. The Legislature further finds and declares that state and local agency employees frequently are unable to communicate with persons requiring their services because of this language barrier. As a consequence, substantial numbers of persons presently are being denied rights and benefits to which they would otherwise be entitled.
>
> It is the intention of the Legislature in enacting this chapter to provide for effective communication between all levels of government in this state and the people of this state who are precluded from utilizing public services because of language barriers."

The Act generally requires state and local public agencies to provide interpreter and written document translation services in a manner that will ensure that LEP individuals have access to important government services. Agencies may employ bilingual staff, and translate documents into additional languages representing the clientele served by the agency. Public agencies also must conduct a needs assessment survey every two years documenting the items listed in Government Code section 7299.4, and develop an implementation plan every year that documents compliance with the Act. You may access a copy of this law at the following url: http://www.spb.ca.gov/bilingual/dymallyact.htm

Faculty List

Disclosures

The following faculty speakers, moderators, and planning committee members have disclosed no financial interest/arrangement or affiliation with any commercial companies who have provided products or services relating to their presentation(s) or commercial support for this continuing medical education activity:

Fyles, Amalia
Higgins, Kim
McCoin, Mikelle
Murphy, Elizabeth
Koliwad, Suneil
Kuo, Charlotte
Tang, Audrey

The following faculty speakers have disclosed a financial interest/arrangement or affiliation with a commercial company who has provided products or services relating to their presentation(s) or commercial support for this continuing medical education activity. All conflicts of interest have been resolved in accordance with the ACCME Standards for Commercial Support:

Thomas Bersot	Consultant, Shareholder, Research and Educational Grants, Speaking Engagements	Abbott Pharmaceuticals Aegereon Gilead Sciences Lilly and Kowa Pharmaceuticals Merck
Lawrence Fisher	Consultant	Roche Diagnostics

This UCSF CME educational activity was planned and developed to: uphold academic standards to ensure balance, independence, objectivity, and scientific rigor; adhere to requirements to protect health information under the Health Insurance Portability and Accountability Act of 1996 (HIPAA); and, include a mechanism to inform learners when unapproved or unlabeled uses of therapeutic products or agents are discussed or referenced.

This activity has been reviewed and approved by members of the UCSF CME Governing Board in accordance with UCSF CME accreditation policies. Office of CME staff, planners, reviewers, and all others in control of content have disclosed no relevant financial relationships.

Speaker Bios

Thomas Bersot, MD, PhD

Thomas Bersot is a Professor of Medicine at UCSF and he is a founding investigator of the Gladstone Institute of Cardiovascular Disease at UCSF. His clinical responsibilities include serving as the chief of the Gladstone Lipid Clinic at the San Francisco General Hospital (SFGH), director of the Gladstone- American Heart Association Lipid Disorders Training Center, and attending on the Internal Medicine and Endocrinology services at the SFGH. Among his UCSF duties he is Co-chairman of the UCSF Committee on Human Research. Dr. Bersot is Immediate Past -President of the National Lipid Association and a member of the Board of Directors of the American Board of Clinical Lipidology. In July 2007 he became a member of the Endocrine and Metabolic Advisory Committee of the United States Food and Drug Administration.

Dr. Bersot is an internationally recognized authority in the area of reducing the risk of developing heart attack and stroke. Research interests include abnormalities of plasma lipid metabolism, especially low levels of high density lipoprotein cholesterol (HDL-C), mechanisms of atherogenesis, obesity and insulin resistance, and therapy of patients with dyslipidemia.

In addition to over 70 research articles he is a co-author of chapters on lipid management in the current editions of several authoritative medical textbooks.

Kim Higgins, RN, CDE

Kim Higgins has been a diabetes nurse educator for over 30 years. Her work ranges from educating patients on managing Type 1 and Type 2 diabetes to training providers to become diabetes educators, and educating primary care providers about diabetes. She works with diabetes and pregnancy/Sweet Success programs intensively. She has worked extensively with the American Association of Diabetes Educators (AADE), serving on the national Board of Directors and has held leadership positions including past president of the San Francisco Bay Area Chapter of AADE and on the Public Affairs Committee where she was integrally involved in the model legislation for states to ensure insurance coverage for those with diabetes and for Medicare to cover blood glucose monitoring strips. Additionally, she helped facilitate the development of the CA-AADE "*Golden State Diabetes Network*", made up of the 12 AADE chapters in California. Kim has held volunteer positions with the Diabetes Coalition of California in conjunction with the California Diabetes Program and is currently immediate past-chair. Locally, she has served on the Alameda County Sharps Coalition since its inception and helped introduce legislation regarding sharps disposal in the state. Additionally, she is a faculty member of the Johnson and Johnson Diabetes Institute in Milpitas, CA.

Lawrence Fisher, Ph.D., ABPP

Dr. Lawrence Fisher completed his doctorate in clinical psychology at the University of Cincinnati and was a USPH Post-Doctoral Fellow at the University of Colorado School of Medicine. He is a Diplomate in Clinical Psychology through the American Board of Professional Psychology. He has been a professor in the Department of Family & Community Medicine at the University of California, San Francisco for over 20 years, and is the Director of The Behavioral Diabetes Research Group at UCSF, and he is currently an Associate Editor of DIABETES CARE.

Dr. Fisher has devoted most of his career to working with patients with chronic disease and their families, trying to understand what factors contribute to why some patients and families do well managing their disease and why others do relatively less well. For the last 15 years he has conducted both cross-sectional and longitudinal NIH and ADA-supported clinical research with patients with diabetes and their families. This work focuses on diabetes distress and depression, disease management, and how patients and families struggle over time to manage chronic health conditions. He is particularly interested in how issues of gender and culture affect these processes. Recently he has also focused on telephone and interactive web-based interventions for patients with chronic disease, and with interventions that help primary care clinicians re-configure the way clinical care is delivered to patients with chronic conditions. He maintains an active clinical practice at UCSF.

Amalia Dangilan Fyles, RN, MSN, CNS, CDE

Amalia Fyles has been a certified diabetes educator for 30 years in the Adult Medical Clinic at San Francisco General Hospital and Medical Center. As a diabetes clinical nurse specialist, she coordinates the Adult Medical Diabetes Self-Management Education Program which has achieved certification as a Recognized Diabetes Program by the American Diabetes Association. She chairs the SFGH Diabetes Education Committee, coordinates the General Medicine Clinic diabetes chronic care nurses, and continues to work with patients with monthly support groups and individual intensive management. In 2010, she received the “Heroes and Hearts” award for her work with patients with diabetes at SFGH.

Lisa Golden, MD

Lisa Golden is Medical Director of Ocean Park Health Center (OPHC), a clinic affiliated with the San Francisco Department of Public Health (SFDPH), which provides primary care services to a predominantly low income, uninsured, multi-ethnic population. Her major interest is in working with the urban underserved and her work has focused particularly on chronic disease management, use of an electronic registry and population based care, cultural competency and medical care of immigrants. She designed and implemented the Diabetes Group Medical Visits Program in Cantonese and English at OPHC, one of the first such programs in the SFDPH community primary care clinics of and actively supports the spread

of this care model to other health care systems. She participated as a senior leader in the Quality Allies Learning Community sponsored by the Robert Wood Johnson Foundation and the California Healthcare Foundation (CHCF). The QALC targeted 20 clinical sites from around the country and was focused on designing, testing, refining and spreading best-practices in self-management support and patient centered care. She has developed a health worker led planned visits program at the clinic, panel management outreach and tracking for patients with diabetes and cardiovascular disease, and clinical support tools that are now being disseminated for use by other clinics in the system.

Dr. Golden received her undergraduate training from Brown University and her medical degree from SUNY/Downstate. She went on to graduate from the UCSF-SFGH Family Medicine Residency Program. She completed a fellowship in the California Healthcare Foundation Leadership Program and is an Associate Clinical Professor of Family Medicine at UCSF where she enjoys teaching chronic disease management and care of the underserved to medical students and residents.

Elissa Hallen, RN, CDE

Currently holds a position at Health First Center for Prevention and Education, a part of the St. Luke's Health Care Center. Her work there includes: working with Community Health Workers as a teamlet to extend the primary care services, and developing training and evaluation methods for the transition of RNs to specialty diabetes care management. Ms. Hallen is also developing and leading exercise groups for people with diabetes (Move to Improve), and leads community diabetes/hypertension/cholesterol support and information groups. Ms. Hallen works at the St. Luke's Diabetes Center as a CDE with individual appointments.

Elizabeth Johnson, MD

Lisa Johnson, MD is a Family Medicine physician, and the Medical Director of Community Primary Care, a network of 15 community based primary care clinics in the San Francisco Department of Public Health. Prior to this position, she was the Medical Director of Quality Improvement Programs for Community Primary Care.

Dr. Johnson has a particular interest in quality data reporting in the safety net setting and in development of new models of primary care, including empanelment and the use of patient care registries to improve chronic disease and preventative care. She has led Kaiser funded PHASE program in SFDPH, and is a member of SFDPH's steering committee for Kaiser Specialty Access Initiative. She collaborated with the San Francisco Community Clinic Consortium to implement a chronic disease registry (i2iTracks) that is shared by primary care safety net clinics across San Francisco. Dr. Johnson is a graduate of the University of Washington School of Medicine and the UCSF Family Medicine program.

Suneil Koliwad, MD, PhD

Suneil Koliwad is an Assistant Professor of Medicine in the Diabetes Center at The University of California San Francisco and holds The Gerold Grodsky, PhD/JAB Chair in Diabetes Research. His work focuses on determining links between dietary fats, inflammation in insulin-sensitive tissues, and the development diabetes type 2.

After finishing his PhD and MD degrees at Baylor College of Medicine, Dr. Koliwad completed a combined residency in Internal Medicine and Pediatrics, culminating with a year as Chief Resident. He then moved with his family to UCSF to begin a fellowship in Endocrinology, opening up the career path that has led to his current position. Clinically, Dr. Koliwad attends in the General Endocrinology and Diabetes Clinics at San Francisco General Hospital, where he teaches students and residents how to care for challenging patients with diabetes in San Francisco.

Charlotte ("Mimi") Kuo, NP

Mimi Kuo is an Adult Nurse Practitioner dedicated to the SFGH Diabetes Clinic since 2008. She also works at a private endocrinology practice.

David Lown, MD

David Lown is the Medical Director at San Francisco Community Clinic Consortium (SFCCC), oversees the diabetes services at St Anthony Free Medical Clinic and is an Assistant Clinical Professor of Medicine at the University of California, San Francisco.

His general interests relate to systems improvement, including issues around clinical practice and health care delivery redesign, as well as the use of technology to improve systems of care and health outcomes. He is also interested in the role of community & societal factors that impact health including both social and structural determinants of health. He has been involved in running group diabetes medical visits, implementing a clinic based telepharmacy consultation service, and participating in chronic care and self management collaboratives.

At SFCCC he oversees the Continuous Quality Improvement Program and the clinical functions of the agency's mobile outreach van. He is involved in QI initiatives at both the local and state level, on issues of homeless and safety net health care, team-based care, chronic disease management, disease registry implementation and the standardization of QI measures across California's community clinics and health centers.

Mikelle McCoin, RD, MPH

Mikelle McCoin is a Registered Dietitian and Lecturer at the University of California, Berkeley, in the Department of Nutritional Sciences & Toxicology. In

addition she lectures at the Gladstone Institute of Cardiovascular Disease in their Lipid Disorder Minifellowship and Update courses. She is an expert panel member for the American Dietetic Association (ADA), reviewing current research literature in order to assist on the development of the disorders of lipid metabolism evidence-based practice guidelines.

Mikelle was the President of the Bay Area Dietetic Association in 2003-2004, the local district of the ADA-affiliated California Dietetic Association. She was awarded Young Dietitian of the Year by the ADA in 2004 and Outstanding Volunteer of the Year by the Bay Area Dietetic Association in 2003.

Mikelle holds a Master of Public Health degree from UCLA and a Bachelor of Science degree in nutritional science from California Polytechnic State University, San Luis Obispo. In conjunction with her graduate studies, she pursued a dietetic internship at the Veteran's Administration, West Los Angeles.

Elizabeth Murphy, MD, DPhil

Elizabeth Murphy has been at UCSF in some capacity or another since completing her medical training in the Harvard-MIT Health Sciences and Technology program in 1994. Currently Dr. Murphy is an Associate Professor of Clinical Medicine at UCSF, Chief of Endocrinology and Metabolism at SFGH and Director of the SFGH Diabetes Program.

Susan Scheidt, Psy.D.

Susan Scheidt is the Director of the Healthy San Francisco-Psychosocial Medicine Team and is a Clinical Professor of Psychology in the UCSF Department of Psychiatry, at San Francisco General Hospital. Dr. Scheidt has worked at SFGH for the past twenty-eight years, developing mental health and primary care integration since 1995. Dr. Scheidt is known for creating practical interventions for patients in the primary care setting, as well as emphasizing team collaboration to provide more effective care. More recently she has been working with public primary care clinics helping to reduce psychosocial barriers in the management of chronic diseases, including diabetes, heart disease, asthma/COPD and chronic pain.

Audrey Tang, FNP

Audrey Tang is a Family Nurse Practitioner working with the SFGH Diabetes Team as part of the Healthy San Francisco Chronic Care Redesign Project. Aside from seeing patients for intensive 1:1 diabetes management, she also runs group visits in Spanish for insulin initiation/support, ongoing diabetes education and for postpartum women with gestational diabetes. Ms. Tang also sees primary care patients in the Family Health Center at SFGH.

Welcome

Elizabeth Murphy, MD, DPhil

The Power of Therapeutic Lifestyle Change

Thomas Bersot, MD, PhD

NUTRITION IN THE 15-MINUTE OFFICE VISIT

Mikelle McCoin, MPH, RD
Senior Nutrition Consultant, Gladstone Institutes
Lecturer, Nutritional Sciences & Toxicology, UCB
mikellem@berkeley.edu

Lecture Outline

- Brief overview of the evidence for the dietary recommendations for CVD prevention
- Review practical simple suggestions to provide to patients
- Discuss counseling considerations for successful behavior change

Reduce Foods Rich in Dietary Components Associated With Increased Risk of CVD

- Saturated fatty acids: <7% of calories
- Trans-fatty acids: <1% of calories
- Dietary cholesterol: <200 mg/day

- Saturated fatty acid & cholesterol restriction can lower LDL-C by 9-16% (ADA, EAL)
- Further reductions can lower LDL-C by ~20% and reduced CVD events (JAMA. 1998; 280:2001-2007).
- Diets rich in trans-fatty acids are associated with increased CVD risk. Trans-fatty acids raise LDL-C and lower HDL-C.

% of Calories Converted to Grams

- <7% of calories from saturated fatty acids:

Population	Calorie level	SF grams
Sedentary women	1800	14
Moderately-active women	2000	16
Sedentary men, active women	2200	17
Moderately-active men	2400	19
Active men	2800	22

- <1% of calories from trans-fatty acids: ~2 g/day:
  - most foods now have <0.5g/serving
  - *partially* hydrogenated vegetable oils

Saturated Fat Content of Selected Foods

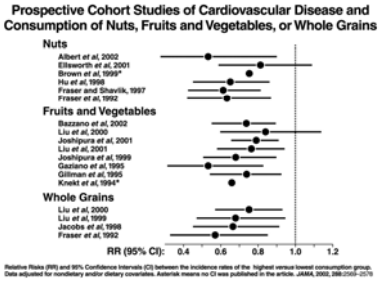
Food	Serving size	SF, grams
Animal protein foods		
Porterhouse steak	3 oz	7
Dark meat poultry w/skin	3 oz	3
Skinless chicken breast	3 oz	<1
Dairy products		
Butter	1 Tbs.	7
Cheese	1 slice	6
Whole fat milk	8 oz	5
Reduced fat, 2% milk	8 oz	3
Tropical oils		
Coconut oil	1 Tbs.	12
Coconut milk	½ c	21
Palm kernel oil	1 Tbs.	11
Palm oil	1 Tbs.	7

Dietary Cholesterol Content of Animal Products

Food	Serving size	Cholesterol content (mg)
Fish, poultry, beef, pork (inc. crab and lobster)	3 oz	65-100
Shrimp	3 oz/16 large	166
Egg yolk	1 yolk	233
Organ meats	3 oz	2,300
Dairy	8 oz	0-34

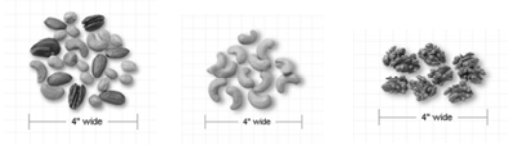
Add Foods Associated With Reduced CVD Risk

- Nuts
- Fruits & vegetables
- Whole grains



Nuts: 1 oz, 5 times / week, is associated with reduced CVD

Caution if overweight = 5 oz= 900 calories



Add Foods Associated With Reduced CVD Risk

- Fish twice per week
  - Secondary prevention= 1 g EPA/DHA per day
  - 21-29% ↓ risk of death when secondary prevention patients ate fish 2x/week or took 1g EPA/DHA
- Alpha-linolenic acid (ALA)
  - Lyon Heart Study found a 72% ↓ risk of CVD with a Mediterranean diet supplemented with ALA

Omega-3 Polyunsaturated Fatty Acids

Omega-3 Fatty Acid	Formula	Source
α-Linolenic Acid (18:3n–3)		Some vegetable oils (canola, soybean), nuts (walnuts), seeds (flaxseed)
Eicosapentaenoic Acid (20:5n–3)		Fish, shellfish; also made *in vivo* from linolenic acid
Docosahexaenoic Acid (22:6n–3)		Fish, shellfish; also made *in vivo* from EPA

EPA / DHA Content of Selected Fish

Fish	EPA + DHA ,g / 3 oz
Herring, Pacific (Atlantic)	*1.81 (1.71)*
Trout, rainbow farmed (wild)	*0.98 (0.84)*
Halibut	*0.4-1.0*
Tuna, fresh	*0.24-1.28*
Sardines	*0.98-1.70*
Salmon, Sockeye	*1*
Salmon, Atlantic farmed (wild)	*1.09-1.83 (1-1.6)*
Mackerel	*0.34-1.57*
Catfish, farmed (wild)	0.15 (0.2)
Cod, Pacific (Atlantic)	0.24 (0.13)
Flounder/Sole	0.42
Haddock	0.2
Tuna, light in water	0.26
Shrimp	0.27

* Underlined = low mercury

α-Linolenic Acid Content of Selected Vegetable Oils, Nuts and Seeds

Recommended Intake: 1.5-3 g/day

Food	α-Linolenic acid (g/Tbs.)	Amount Needed to Provide 1.5-3 g/day (Tbs.)
Olive oil	0.1	15-30
Soybean oil	0.9	1.5-3
Canola oil	1.3	1-2.5
Walnut oil	1.4	1-2.5
Walnuts, English	0.7	2-4
Flaxseeds (ground)	2.2 (1.2)	0.7-1.5 (1-2)
Flaxseed oil	8.5	0.2-0.4 (~1 tsp)

Circulation. 2002;106:2747-2757.

Weight Loss & Exercise

- 7-10% weight loss can reduce the risk of developing diabetes by 50-60%
  DPS: NEJM. 2001;344:1342-1350.; DPP: NEJM.2002;346:393-403.
- Physical activity: 1-1.5 hrs of walking/wk = 51% ↓ risk of CHD vs. non regular walkers (RR: 0.49; 95% CI: 0.28-0.86), WHI, (*JAMA*. 2001; 285:1447-454.)
  - 20 min 3-4x/week

AHA/ACSM Recommendations (2007)

- Do moderately intense (break a sweat, hold a conversation) cardio 30 minutes a day, five days a week (can accumulate)

OR

- Vigorously intense cardio 20 minutes a day, 3 days a week

AND

- Do eight to 10 strength-training exercises, eight to 12 repetitions of each exercise twice a week.
- Weight loss: 60 to 90 minutes of physical activity may be necessary

http://www.acsm.org

Practical & Simple Messages

Patient Dietary Handouts

Lifestyle Recommendations for Heart Disease Management & Prevention

Fat Content of Beef, Pork, Poultry and Fish

Nutritional Content of Available Margarines
These margarines are healthier choices

	Cal	Fat (g)	SF (g)	Trans (g)	Sterol (g)	Ingredients	Cost /oz
Benecol light	50	5	0.5	0	0.85	Water, canola, soybean, part hydrog soybean	0.80
Smart Balance light w/flax	45	5	1.5	0		Water, blend (palm fruit, soybean, canola, flax and olive oil); 300 mg n-3	0.19
Olivio	80	8	1.5	0		Blend (liquid canola, soybean, hydrog soybean, olive oil, part hydrog soybean); 500 mg ALA	
Promise	80	8	1.5	0		Blend (soybean, canola, sunflower, palm, palm kern.)	0.12
Brummel & Brown	45	5	1	0		Water, blend (soybean, part hydrog soybean)	0.19

*Per Tablespoon

Useful Approved Claims on Meat Packaging

Trans-free Does Not Always Mean "Healthy"

Make sure to watch the SF content in "trans-free" products

Too much saturated fat, opt for 2 g or less/TBS.

It contains palm oil, an oil rich in saturated fat

Tools For Successful Behavior Change

Motivational Interviewing Questions & Cartoon: Communication and Education Skills for Dietetics Professionals, 5th edition. Holli, et al. 2008.

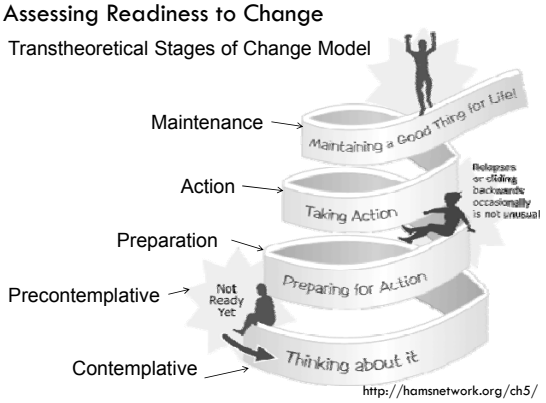
Some Challenges Facing The Practitioner

- Lack of time
- Language & cultural barriers
- Patient is not ready to change

How can you be the most effective when faced with these challenges?

Assessing Readiness to Change

Transtheoretical Stages of Change Model



http://hamsnetwork.org/ch5/

Tools For Successful Behavior Change

- If they are not ready to change ⟶ help them identify the importance of nutrition and the diet/disease link
  - Perceived susceptibility, severity, benefits & barriers
  - Utilize client-centered counseling & motivational interviewing

Questions to Get Started

- Do you think your new diagnosis is serious?
- Do you think it is important to change your diet?
- How important is changing your diet on a scale of 1-10?
  - What would need to happen for your importance score to move up from X to X?
- What would have to happen for you to seriously consider changing your diet?
  - How do you think we could make that happen?
- If you were to decide to change, what might your options be?

Tools For Successful Behavior Change

- If they are ready to change ⟶ let <u>them</u> identify 1-2 changes they will make by their next visit
  - Work from their past experiences

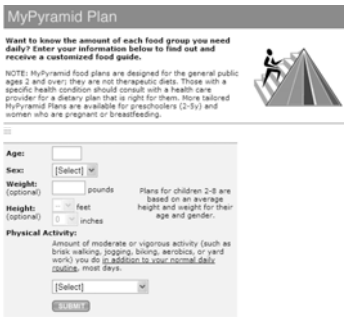
Questions to Get Started

- Have you ever tried to change your diet before?
  - What did you like about this?
  - What challenges did you face?
  - How can you overcome these?
- If you haven't tried to change your diet before, what challenges do you think you will face when trying to do so?
  - How can you overcome these?
- What diet changes do you feel are necessary to make?
- How can I help you succeed?
- What would make you more confident in making these changes?

Once They Are In The Action Stage:
Tools For Successful Behavior Change

- Allow the patient to determine the changes they want to make
- Specific changes
- Demonstrate how the changes will fit into their lifestyle- who?
- Suggest the patient commit to only a few changes at a time
- Self-rewards for positive reinforcement
- Build-off past experiences, problem-solve
- Suggest a support system (family, other groups)
- Frequent self-monitoring: diet (daily dairy, calories, fat grams, servings etc.), weight, exercise (steps)
- Provide handouts as a reinforcement
- Set realistic clinical goals
- Utilize registered dietitians for more in depth counseling

My Pyramid Personalized Plan
mypyramid.gov



DIET QUESTIONNAIRE

Patient Name:_____ Date of birth: _____ Date: _____

Who prepares your meals? _____ Who does the shopping in your household? _____

What cooking methods are used? (mark all that apply)

□ Baking □ Broiling □ Frying □ Grilling/BBQ □ Poaching □ Sautéing □ Steaming

What oil or cooking fat is used? _____

Do you read food labels? Y / N

How many **times per week** do you eat away from home? _____ Where do you eat? _____

Do you snack between meals? Y / N If yes, what do you snack on? _____

How many **times per week** do you eat each of the following?

Chicken/turkey _____ Eggs_____ Fish _____ Red meat (beef, lamb, pork) _____ Vegetarian_____

How many **times per day** do you eat poultry, eggs, fish, or red meat? _____

Do you eat dairy foods (cheese, milk, yogurt)? Y / N Please list the kind and frequency below:

1) _____ How often? _____ 2) _____ How often? _____ 3) _____ How often? _____

Do you eat sweets? Y / N Please list the kind and frequency below:

1) _____ How often? _____ 2) _____ How often? _____ 3) _____ How often? _____

Do you eat fruit and vegetables? Y / N Please list the kind and frequency below:

1) _____ How often? _____ 2) _____ How often? _____ 3) _____ How often? _____

How do you prepare them? _____

How many times per day to you eat bread, grains, pasta, and cereal? _____

What do you choose to drink? Please list the kind and frequency below (include water and alcohol):

1) _____ How often? _____ 2) _____ How often? _____ 3) _____ How often? _____

What is the most active thing you do during the day? _____ How often? _____

Do you have food allergies? Y / N Do you avoid any foods? Y / N

Are you on any special diets? Y / N Please describe? _____

Please list any vitamin or herbal supplements you take? _____

Please list any specific concerns you would like to discuss: _____

Patient Signature:_____

Mikelle McCoin, MPH, RD
5/2003

All Patients

Diet: low saturated fat, trans-fat and dietary cholesterol

A diet, that includes whole grains, fruits and vegetables, lean meat, poultry, nuts and low-fat dairy reduces the risk of CHD, lowers LDL-C by 9-16% and combined with a low sodium intake reduces systolic BP by 4 – 12 mm Hg and diastolic by 1 – 3 mm Hg. (Nurses Health Study; Health Professionals Follow-up Study; National Health and Nutrition Examination Survey, American Dietetic Association, evidence analysis library)

Very low SF and cholesterol diets (vegetarian based) have been shown to reverse atherosclerosis, reduce cardiac events and produce ~20% reduction in LDL cholesterol. (JAMA. 1998; 280:2001-2007). A diet with <6% SF reduced the risk of CHD, stroke and CVD by 18% (JAMA. 2006;295:655-666)

Fish rich in omega-3 fatty acids at least twice per week

Flounder/Sole, Halibut, Herring, Mackerel, Rainbow Trout, Salmon, Sardines.

31% reduction in CHD death and non-fatal MI, primarily due to a reduction in death. (Nurses Health Study: *JAMA.* April 10, 2002;287:1815-1821.)
72-81% reduced risk of sudden death. Physicians Health Study: (*NEJM.*2002;346:1113-1118.)
29% reduction in total mortality in secondary prevention pts (DART: *Lancet.* September 30, 1989:757-761)

Alpha-linolenic acid; 1.5-3 g per day

Flaxseed oil, 1 tsp. per day	Canola oil, 1-2 Tbs. per day	Walnuts, 2-4 ounces per day
Flaxseeds, ground, 2 tsp. per day	Walnut oil, 1-2 Tbs. per day	

45% reduced risk of fatal CHD in primary prevention pts. (Nurses Health Study: *AJCN.*1999;69:890-897)
52% reduced risk non-fatal MI, fatal MI, and sudden cardiac death in high risk pts (*Lancet*. 2002; 360:1455-61.
72% reduction in CVD death plus non-fatal MI in secondary prevention pts. (Lyon Heart Study, *Lancet.* June 11, 1994;343:1454-1459.)
AHA: *Circulation.* 2002;106:2747-2757)

Exercise

Expend between 600-1,400 calories per week (~100 Kcals/mile, equivalent to 6-14 miles/week or 1-2 miles per day)
45% reduced risk of CHD (death, non-fatal events, revascularization procedures) after adjusting for other risk factors. (Women's Health Study: *JAMA.* 2001; 285:1447-454.)

Three or more deeply-colored (purple/blue, red, green, white, yellow/orange) fruits and vegetables per day (more is better)

15% reduced all-cause mortality (27% lower stroke incidence, 42% lower stroke mortality, 24% lower ischemic heart disease mortality, 27% lower cardiovascular disease mortality) after adjusting for other risk factors. (NHANES: *AJCN.* 2002;76:93-99.). Deeply-colored fruit/vegetables is a new recommendation from the AHA (Circ. 2006;114:82-96).

Obese and Metabolic Syndrome Patients

Weight loss of 5-7% of body weight by exercising 2.5 or more hr/week and eating total fat <30% of calories, saturated fat <10% of calories, fiber intake 15 g/1000 Kcal reduced the risk of developing diabetes mellitus by 58% (Diabetes Prevention Program: *NEJM.* 2002; 346:393-403; Diabetes Prevention Study: *NEJM.* 2001;344:1343-1350)

Patients with Documented Coronary Heart Disease

EPA/DHA fish oil supplements; 1 g per day (excluding pts w/ angina taking nitrates or pts w/ defibrillators)

Options (these brands were tested by Consumerlab.com for content and purity; not a complete list): Advocare, Carlson Super omega-3 fish oil, Coromega, CVA natural fish oil, GNC preventive Nutrition omega complex, Kirkland (Costco), Nature's Bounty, Nutrilite omega-3 complex, Puritan's Pride cholesterol free fish oil, Sav-on Osco by Albertson's Natural fish oil, The Vitamin Shoppe Essential Oils & Fatty Acids EPA-DHA omega-3 fish oil, Vitamin World, Whole Foods.

30-45% reduced risk of cardiovascular mortality. (GISSI: *Lancet.* August 7, 1999; 354: 447-455.; AHA Scientific Statement: *Circ.* 2002;106:2747)

Mikelle McCoin, MPH, RD 6/06

Diet Recommendations

Only follow the recommendations that have a checkmark.

All Patients

_____ **Low saturated fat, trans-fat, and cholesterol diet:** see supplemental material

_____ **Activity: expend 600-1,400 calories per week (6-14 mi/week=1-2 mi/day)**
Studies show exercise reduces ones risk of having a heart attack and dying from a heart attack. Exercise also lowers triglyceride values and raises HDL (good) cholesterol values.

_____ **Five or more deeply and multi-colored fruit and vegetable servings per day (purple/blue, red, green, white, yellow/orange)**
Studies show people that eat 5+ fruit/vegetables/day have reduced risk of all causes of death.

_____ **Fish rich in healthy fats; twice per week**
Studies show people that eat fish rich in healthy fats (EPA/DHA) at least twice per week reduce their risk of dying when they have a heart attack.

Options: Flounder/Sole, Halibut, Herring, Mackerel, Rainbow Trout, Salmon, Sardines

_____ **Alpha-linolenic acid; 1.5-3 g per day**
Studies show people that eat foods and oils rich in linolenic acid, a healthy fat, reduce their risk of having a heart attack.

Options:
Flaxseed oil, 1 tsp. per day
Flaxseeds, ground, 2 tsp. per day
Canola oil, 1-2 Tbs. per day
Walnut oil, 1-2 Tbs. per day
Walnuts, 2-4 ounces per day

_____ **Soluble fiber: 10-25 g per day:** Soluble fiber can help reduce LDL (bad) cholesterol.

Options: Try to meet goals with food first: whole grains, high-fiber cereals, fruits, vegetables
If goals are not reached a fiber supplement may be used in combination with foods:
Metamucil, 1 tsp original or 1Tbs orange=2 g soluble fiber
Metamucil, 2 fiber wafers= 3 g soluble fiber

_____ **Phytosterol margarines:** Phytosterols are chemicals in plants that help to lower LDL-chol.

Options: Benecol light, 1 Tbs. 2-4 times/day. Cost: ~$15/mo
Take Control light, 1 Tbs. 1-2 times/day. Cost: ~$15/mo
Benecol Chews, 1 chew 2-4 times/day. Cost: ~$37/mo
Minute Maid Heart Wise Orange Juice, 1 8 oz glass twice/day. Cost: ~$35/mo
CardioSterol capsules. 2 capsules twice/day. Cost: ~$17/mo

High-risk Patients- **take these only if you were told to**

_____ **EPA/DHA fish oil supplements; 1 g per day:** Studies have shown people that take fish oil supplements lower their risk of dying from a heart attack.

Options (not a complete list): Carlson super omega-3, GNC preventive nutrition omega complex, Kirkland (Costco) (3/day, cost: 22$/yr), Nature's Bounty (available at Walgreens), Puritan's Pride cholesterol free fish oil, Sav-on Osco by Albertson's Natural fish oil, The Vitamin Shoppe, Vitamin World, Whole Foods.

Mikelle McCoin, MPH, RD Revised 6/2006

The Gladstone Institute of Cardiovascular Disease

Lifestyle Recommendations for Heart Disease Management & Prevention

Studies show people that follow these types of recommendations lower their LDL (bad) cholesterol levels and lower their risk for heart disease.

Reduce:	**Options to use instead:**
Butter, lard, ghee, suet	___ Use canola oil or cooking spray for cooking ___ Use walnut oil and olive oil in salad dressings ___ Use liquid pump margarines or one of these: Benecol Light, Smart Balance light with flax, Promise, Olivio, Brummel & Brown ___ Make sure the first ingredient in your margarine is water or canola oil
Beef, lamb and pork	___ Eat fish at least twice per week: salmon, sardines, trout ___ Eat lentils, beans & tofu instead of meat ___ Make ½ of your plate vegetables & fruits ___ Eat vegetarian meals daily or weekly ___ Eat skinless chicken breast & thigh, turkey, fish, extra-lean ham, pork tenderloin, buffalo, ostrich ___ Eat "extra-lean" & "lean" meats (see additional handout) ___ Eat S*elect* or *Choice* grades of meat, "Safeway select" ___ Eat meat & chicken less often than you currently eat it ___ When eating meat, eat less than a deck of cards ___ Trim away visible fat on meat ___ Pour off the fat drippings ___ Choose low-fat, 99% fat-free and low sodium sandwich meats
Cream, whole & 2% fat dairy and cheese	___ Milk: skim (fat-free) or 1% milk-fat ___ Low-fat & reduced-fat cheese
Eggs	___ Egg whites (2 eggs whites = 1 egg in recipes) ___ Egg Beaters (or other egg substitutes)
Store-bought snacks, pastries, desserts	___ Eat fruits, vegetables & non-fat dairy as snacks ___ Eat small amounts of salt-free nuts as snacks (7-10 nuts every few days) ___ Read labels: eat foods with 0-2g of saturated fat and trans-fat and foods that have no palm or "*partially- hydrogenated"* oils ___ Eat "baked" or "low-fat" snacks ___ Eat smaller servings
Refined grains	___ 100% whole-grain breads and cereals: brown rice, quinoa, barley, millet, amaranth, whole-wheat pasta and whole wheat couscous ___ Look for %100 whole on the ingredient list

Mikelle McCoin, MPH, RD, Updated 4/11

The Gladstone Institute of Cardiovascular Disease

Lifestyle Recommendations for Heart Disease Management & Prevention (Side 2)

Reduce:	**Options to use instead:**
Eating out	___ Prepare your meals at home ___ Prepare foods by steaming, baking, broiling, grilling ___ Pack your lunch ___ If you do eat out, take ½ of your meal home with you
The amount of food & beverages you eat & drink	___ Eat on a salad plate ___ Take a break from eating before you go back for a second serving ___ Drink water, not soda or fruit juice ___ If you drink alcohol, have only 1 drink for women and 2 for men, per day
Physical inactivity (be more active)	___ Increase your activity by 5-10 minutes/day ___ Find an activity you love to do and do it!

The Gladstone Institute of Cardiovascular Disease

Fat Content of Beef, Pork, Poultry and Fish
Based on a 3 oz cooked serving size unless otherwise noted

	Extra Lean 0-5 g (<2 g SF)	Lean 6-10 g (≤4.5g SF)	Medium Fat 11-15 g	High Fat 16-20 g	Very High Fat 20+ g
Beef		Eye of round Ground beef (7% fat) Round tip Top of round	Bottom round Flank Ground beef (10% fat) 1 Hot dog 1 Sausage Top sirloin Top loin	Arm pot roast Corned beef Ground beef (20% fat) Porterhouse steak Ribeye Tenderloin T-bone steak	
Chicken	Breast (no skin)	Breast (w/skin) 1 Drumstick (no skin) Ground chicken Thigh (no skin) 1 Wing (no skin)	Thigh (w/skin) Chicken hotdog 1 Drumstick (w/skin) Ground chicken	1 Wing (w/skin)	
Fish- *do not restrict medium fat fish, eat fish at least twice/ week*	Bass Bluefish Cod Gefiltefish (2 pcs.) Halibut Monkfish Perch Seabass Shark Snapper Swordfish Tuna	Catfish Herring, Atlantic Trout Mackerel, Pacific Salmon, Coho Sockeye Yellowtail	Eel Herring, Pacific Mackerel, Atlantic Salmon, Atlantic Chinook		
Lamb			Fore shank Leg, whole Loin Sirloin chop	Leg, shank half Leg, sirloin half Ground lamb Ribs Shoulder blade	
Pork	Ham (extra lean) Tenderloin	Boneless sirloin Canadian bacon Ham (regular) Roast Sirloin roast Top loin roast	Centerloin roast Leg, rump half Loin, whole Rib chop Rib roast Shoulder blade steak Sirloin chop Top loin chop	Arm picnic, shoulder Ground pork Leg, shank half Ribs Sausage Shoulder blade roast	Knockwurst Liverwurst Loin blade roast or chop Shoulder blade roll Spareribs
Turkey	Breast (no skin) Dark meat (no skin) Ground turkey (1% fat) Turkey bacon, 2 sl. Wing (no skin)	Breast (w/skin) Dark meat (w/skin) Wing (w/skin) Ground turkey (7 and 10% fat)	1 Turkey hot dog		
Veal	Leg, top round	Ground veal Shoulder arm Shoulder blade Sirloin and loin	Breast Loin chops Rib		

Mikelle McCoin, MPH, RD
5/2003

http://www.nal.usda.gov/fnic/foodcomp/search/

The Gladstone Institute of Cardiovascular Disease

Diet Recommendations for Triglyceride Levels Between 150 and 799 mg/dL

Studies show that people with triglyceride levels between 150 and 799 mg/dL who eat a moderate carbohydrate diet (<50% of calories from carbohydrates) and avoid regular alcohol consumption can reduce their triglyceride values.

Limit Use of These:	**Options to use instead:**
Regular alcohol (daily or every other day)	___ Water, sugar-free beverages, diet sodas ___ No alcohol (preferable) but 1-2 drinks per week is acceptable
Juice, soda, sweetened beverages	___ Water, sugar-free beverages, diet sodas
Large servings of breads, pasta, rice and grains	___ Reduce your servings by 1/3
Refined grains (white rice / bread)	___ "Whole grain" breads and cereals: oat bran, oatmeal, brown and white rice, 100% whole-wheat bread, polenta, millet
Carbohydrate snack foods (pretzels, crackers, chips, cookies)	___ Nuts, olives
Raisins or sugar on cereal	___ Nuts, flax seeds
High saturated fat diet	___ Lean meats, non-fat dairy products, see supplemental materials

Try to be physically active each day!

The Gladstone Institute of Cardiovascular Disease

Diet Recommendations for Triglyceride Levels Above 800mg/dL

Limit Use of These:	**Options to use instead:**
Alcohol (avoid completely)	___ Water, sugar-free beverages, diet soda
Butter, oils	___ For cooking, use a non-stick pan or coat the pan lightly with a vegetable oil spray; season with lemon, orange, or tomato juice, herbs, spices, fruits, or broth ___ For sandwiches and salads, use spicy mustard, lemon juice, flavored vinegar, hummus, or salsa for flavor
Cream, whole, 2%, or 1% fat dairy products	___ Skim (fat-free) milk ___ Non-fat sour cream
Regular cheese	___ Fat-free cheese, or small amounts of light or low-fat cheese, including ricotta and part-skim mozzarella
High-fat beef, lamb, and pork	___ Lean fish (tuna, snapper, cod, halibut) ___ Chicken and turkey most days of the week (remove the skin from poultry) ___ Vegetarian meals weekly ___ Lean cuts of red meat (eye of round, round tip, top of round) ___ Trim away visible fat on meat ___ Lean or extra lean ground beef and turkey (<7% fat) ___ Choose "low-fat," "99% fat-free" sandwich meats
Fried foods and high-fat snacks	___ "Baked" crackers, chips ___ "Low-fat" crackers, cookies and snacks ___ "Sugar-free cookies and snacks (usually lower in calories) ___ Avoid foods made with "partially hydrogenated oils"
Mayonnaise and salad dressing	___ "Fat-free" or "light" mayonnaise or salad dressings ___ Mustard, ketchup, and other fat-free condiments
Eggs	___ Egg whites (2 egg whites = 1 egg in recipes) or egg substitutes
Juice, soda, sweetened beverages	___ Water, sugar-free beverages, diet sodas
Refined grains (white rice / bread)	___ "Whole grain" breads and cereals: oat bran, oatmeal, brown and white rice, 100% whole-wheat bread, polenta, millet
Fast food (cheese burgers, French fries, fried chicken)	___ Grilled skinless chicken, salad

CUESTIONARIO DE DIETA (Diet Questionnaire)

Nombre del paciente:_____ Fecha de nacimiento: _____ Fecha: _____

¿Quién prepara sus alimentos? _____ ¿Quién hace las compras en su casa? _____

¿Qué métodos de cocina utiliza? (marque todas las que apliquen)

□ Hornear □ A la parrilla □ Freír □ A las brasas □ Escalfar □ Saltear □ Cocer al vapor

¿Qué aceite o grasa para cocinar se utiliza? _____

¿Usted lee las etiquetas de los alimentos? S / N

¿Cuántas **veces por semana** come fuera de casa? _____ ¿Dónde come? _____

¿Come refrigerios entre comidas? S / N Si lo hace, ¿qué tipo de refrigerios (meriendas) come? _____

¿Cuántas **veces por semana** come algo de lo siguiente?

Pollo/pavo _____ Huevos_____ Pescado _____ Carne roja (res, cordero, puerco) _____ Vegetariana_____

¿Cuántas **veces por día** come carne de ave, huevos, pescado, o carne roja? _____

¿Come alimentos lácteos (queso, leche, yoghurt)? S / N Por favor indique los tipos y la frecuencia con que los come:

1) _____ ¿Con qué frecuencia? ____ 2) _____ ¿Con qué frecuencia? ____ 3) _____ ¿Con qué frecuencia? ____

¿Come postres? S / N Por favor indique los tipos y la frecuencia con que los come:

1) _____ ¿Con qué frecuencia? ____ 2) _____ ¿Con qué frecuencia? ____ 3) _____ ¿Con qué frecuencia? ____

¿Come fruta y vegetales? S / N Por favor indique los tipos y la frecuencia con que los come:

1) _____ ¿Con qué frecuencia? ____ 2) _____ ¿Con qué frecuencia? ____ 3) _____ ¿Con qué frecuencia? ____

¿Cómo los prepara? _____

¿Cuántas veces por día come pan, granos, pastas y cereal? _____

¿Qué es lo que elige para beber? Por favor indique los tipos y la frecuencia con que los toma:(incluya agua y alcohol):

1) _____ ¿Con qué frecuencia? ____ 2) _____ ¿Con qué frecuencia? ____ 3) _____ ¿Con qué frecuencia? ____

¿Cuál es la cosa más activa que hace durante el día? _____ ¿Con qué frecuencia? _____

¿Usted tiene alergias a alimentos? S / N ¿Evita algunos alimentos? S / N

¿Está en alguna dieta especial? S / N Por favor descríbala _____

Por favor mencione cualquier vitamina o complementos de hierbas que tome _____

Por favor mencione todos los asuntos que le gustaría discutir: _____

Firma del paciente:_____

Prescripción de dieta (Diet Prescription)

Sólo siga las recomendaciones de dieta marcadas

Todos los pacientes

_____ **Dieta baja en grasas saturadas, ácidos grasos trans y colesterol:** ver material adicional

_____ **Actividad: quemar 600-1,400 calorías por semana (6-14 mi/semana; 1-2 mi/día)**

Los estudios muestran que el ejercicio reduce el riesgo de sufrir un ataque al corazón y morir. Además, el ejercicio reduce los valores triglicéridos y aumenta los valores de colesterol HDL (bueno).

_____ **Cinco o más porciones de frutas y vegetales por día**

Los estudios muestran que las personas que comen 3 o más frutas/vegetales por día tienen un riesgo menor de todas las causas de muerte.

_____ **Pescado rico en grasas saludables, dos veces por semana.**

Los estudios muestran que las personas que comen pescado rico en grasas saludables (EPA/DHA), por lo menos dos veces a la semana, reducen su riesgo de morir al momento de sufrir un ataque al corazón.

Opciones: Platija (*flounder*)/lenguado (*sole*), halibut, arenque (*herring*), caballa (*mackerel*), trucha arcoiris, salmón, sardinas

_____Ácido alfa linoléico (Alpha-linoleic acid), 1.5-3 g por día

Los estudios muestran que las personas que comen alimentos y aceites ricos en ácido linoléico, una grasa saludable, reducen su riesgo de sufrir un ataque al corazón.

Opciones:

Aceite de linaza, 1 cucharadita al día
Linaza (semillas de lino), molida, 2 cucharaditas al día
Aceite de canola, 1-2 cucharas grandes al día
Aceite de nuez de castilla, 1-2 cucharas grandes
Nueces de castilla, 2-4 onzas al día

_____ **Fibra soluble: 10-25 g al día:** La fibra soluble puede ayudar a reducir el colesterol LDL (malo).

Opciones: Primero intente alcanzar los objetivos con alimentos: granos enteros, cereales altos en fibra, frutas, vegetales. Si no se alcanzan los objetivos, se puede utilizar un complemento de fibra en combinación con los alimentos:
Metamucil, 1 cucharadita del original o 1 cuchara grande del de naranja = 2 g de fibra soluble
Metamucil, 2 galletas de fibras = 3 g de fibra soluble

_____ **Margarinas de phytosterol:** Los physterols (fitosterole)s son sustancias químicas en plantas que ayudan a reducir el colesterol LDL.

Opciones: Benecol Light, 1 cuchara grande. 2-4 veces por día. Costo: ~$15 por mes
Take Control light, 1 cuchara grande. 1-2 veces por día. Costo: ~$15 por mes
Benecol Chews, 1 comprimido masticable 2-4 veces por día. Costo: ~$37 por mes
Jugo de naranja Minute Maid Heart Wise, 1 vaso de 8 oz (237ml) al día. Costo: ~$35 por mes
Cápsulas CardioSterol. 2 cápsulas dos veces por día. Costo: ~$17 por mes

Pacientes en alto riesgo – tomar estas sólo si se le dijo que lo hiciera

_____ **Suplementos de aceite de pescado EPA/DHA (EPA/DHA fish oil supplements), 1 g por día:** Los estudios muestran que las personas que toman suplementos de aceite de pescado están en menor riesgo de morir por un ataque al corazón.

Opciones (no es una lista completa): Carlson super omega-3, complejo omega de nutrición preventiva de GNC, Kirkland (Costco) (3 por día, costo: 22$/yr), Nature's Bounty (disponible en Walgreens), aceite de pescado sin colesterol Puritan's Pride, aceite de pescado natural de Sav-on Osco by Albertson, The Vitamin Shoppe, Vitamin World, Whole Foods.

El Instituto Gladstone de Enfermedades Cardiovasculares

Contenido graso de la carne de res, puerco, ave y pescado (Fat Content of Meats)

Con base en una porción cocinada de 3 oz (85g), a menos que se especifique otra cosa

	Extra magro 0-5 g (<2 g SF)	Magro 6-10 g (≤4.5g SF)	Medio grasoso 11-15 g	Alto en grasa 16-20 g	Muy alto en grasa 20+ g
Res		Carne para mechar (*eye of round*) Carne molida (7% grasa) Punta de la bola (*round tip*) Cuete (*top of round*)	Rueda (*bottom round*) Falda (*flank*) Carne molida (10% grasa) 1 hot dog 1 salchicha Top sirloin Lomo (*top loin*)	Puchero Carne de res curada *(corned beef)* Carne molida (20% grasa) Bistec Porterhouse Ribeye Tenderloin Bistec T bone	
Pollo	Pechuga (sin pellejo)	Pechuga (con pellejo) 1. Pata (sin pellejo) Pollo molido Muslo (sin pellejo) 1 Ala (sin pellejo)	Muslo (con pellejo) Hot dog de pollo 1 pata (con pellejo) Pollo molido	1 Ala (con pellejo)	
Pescado	Robalo (*bass*) Anjova (*bluefish*) Bacalao *Gefiltefish* (2 porciones) Halibut Rape (*monkfish*) Perca (*perch*) Lobina (*seabass*) Tiburón Pargo (*snapper*) Pez espada Atún	Bagre (*catfish*) Arenque (*herring*), atlántico Trucha Caballa,(*mackerel*) Pacífico Salmón Coho Sockeye Serviola (*yellowtail*)	Anguila (*Eel*) Arenque (*herring*), Pacífico Caballa (*mackerel*), Atlántico Salmón Atlántico Chinook		
Cordero			Cuadril (*fore shank*) Pierna, completa Lomo Chuleta de sirloin	Pierna, con codillo Pierna, con sirloin Cordero molido Costillas Paleta	
Puerco	Jamón (extra magro) Tenderloin	Sirloin sin hueso Tocino canadiense Jamón (regular) Asado Asado de sirloin Asado de lomo	Asado de centerloin Pierna, mitad de cadera Lomo, completo Chuleta de costilla Asado de costilla Bistec de paleta Chuleta de sirloin Chuleta de lomo	Paleta "*arm picnic*" Puerco molido Pierna, con codillo Costillas Salchicha Asado de paleta *(shoulder blade roast)*	Knockwurst Liverwurst Asado o chuleta de lomo con hueso Rollo de paleta Costillas
Pavo	Pechuga (sin pellejo) Carne oscura (sin pellejo) Pavo molido (1% grasa) Tocino de pavo, 2 reb. Ala (sin pellejo)	Pechuga (con pellejo) Carne oscura (con pellejo) Ala (con pellejo) Pavo molido 7 y 10% grasa	1 hot dog de pavo (turkey)		
Ternera	Pierna, cuete *(top round)*	Ternera molida (*ground veal*) Delantero *(shoulder arm)* Paleta (shoulder blade) Sirloin y lomo *(loin)*	Pechuga *(breast)* Chuletas de lomo *(loin chops)* Costilla *(rib)*		

El Instituto Gladstone de Enfermedades Cardiovasculares

Dieta baja en grasas saturadas, ácidos grasos trans y colesterol

(Low Saturated Fat, Trans-fat and Cholesterol Diet)

Los estudios muestran que las personas que llevan una dieta baja en grasas saturadas, ácidos grasos trans y colesterol, reducen sus niveles de colesterol LDL (malo).

Limite el uso de estos:	**Opciones para sustituirlos:**
Mantequilla	___ Margarinas – algunas buenas marcas son: "Canoleo Soft," "Canola Harvest, Non-Hydrogenated," "Benecol Light," y "Take Control Light"
	___ Aceites: Aceite de linaza (flaxseed), canola, nuez de castilla (walnut), oliva
Productos lácteos de crema entera o con 2% de grasa	___ Leche descremada (sin grasa) o con 1% de grasa de leche
Queso normal	___ Queso bajo en grasa: ricotta, mozzarella semi descremado (part-skim), y quesos que dicen "bajo en grasa" ("low-fat")
Carne de res, cordero y puerco alta en grasa	___ Pescado al menos dos veces por semana ___ Pollo y pavo casi todos los días de la semana ___ Comidas vegetarianas semanalmente ___ Cortes magros de carne roja [cuete (round, chuck, sirloin, lomo] ___ Carne de res y pavo molida magra o extra magra (<7% grasa) ___ Carne de primera calidad o selecta con grasa mínima ___ Quítele la grasa visible a la carne ___ Elija carnes frías "bajas en grasa" o "99% libre de grasa" ___ Quite el pellejo de la carne de ave
Huevos	___ Claras de huevos (2 claras = 1 huevo en recetas) ___ *Egg Beaters* (otro sustituto del huevo)
Comidas fritas y refrigerios altos en grasas	___ Galletas, papas "horneadas" ___ Galletas, galletas y refrigerios "bajos en grasa" ___ Galletas y refrigerios "sin azúcar" (por lo general bajos en calorías) ___ Evite alimentos hechos con "aceites parcialmente hidrogenados" *"partially hydrogenated oils"*
Mayonesa	___ Mayonesa "sin grasa" o "ligera" ___ Mostaza, salsa de tomate, y otros condimentos sin grasa
Granos refinados	___ Pan y cereales de "grano entero": salvado de avena, harina de avena, arroz integral y arroz silvestre, pan de trigo entero al 100%, polenta, cebada, mijo (millet)

Mikelle McCoin, MPH, RD
5/03

El Instituto Gladstone de Enfermedades Cardiovasculares

Recomendaciones de dieta para niveles de triglicéridos entre 150 y 799 mg/dL

(Diet Recommendations for Triglyceride Levels Between 150 and 799 mg/dL)

Los estudios muestran que las personas con niveles de triglecéridos entre 150 y 799 mg/dL que llevan una dieta de carbohidratos moderada (<50% de calorías de carbohidratos) y evitan el consumo regular de alcohol, pueden reducir sus valores de triglecéridos.

Limite el uso de estos:	**Opciones para sustituirlos:**
Alcohol regular (diario o cada tercer día)	___ Agua, bebidas sin azúcar, sodas dietéticas ___ 1-2 bebidas por semana es aceptable, pero es preferible evitar el alcohol.
Jugo, soda, bebidas endulzadas	___ Agua, bebidas sin azúcar, sodas dietéticas
Grandes porciones de pan, pasta, arroz y granos	___ Reduzca sus porciones en 1/3
Granos refinados (arroz blanco/pan)	___ Pan y cereales de "grano entero": salvado de avena, harina de avena, arroz integral y blanco, pan de trigo entero al 100%, polenta, cebada, mijo (millet)
Refrigerios carbohidratados (pretzels, galletas saladas, papas fritas, galletas)	___ Nueces, aceitunas
Pasas o azúcar en el cereal	___Nueces, linaza (semillas de lino)

¡Intente estar activo físicamente todos los días!

Recomendaciones de dieta para niveles de triglicéridos arriba de 800 mg/dL

(Diet Recommendations for Triglyceride Levels Above 800 mg/dL)

Limite el uso de estos:	**Opciones para sustituirlos:**
Alcohol (evítelo completamente)	___ Agua, bebidas sin azúcar, sodas dietéticas
Mantequilla, aceites	___ Para cocinar, utilice un sartén antiadherente o cubra el sartén ligeramente con aceite vegetal rociado; condimente con jugo de limón, naranja o tomate, hierbas, especias, frutas o caldo ___ Para los sándwiches y ensaladas, utilice mostaza muy condimentada, jugo de limón, vinagre sazonado, hummus, o salsa para el sabor
Productos lácteos de crema entera o con 2% o 1% de grasa	___ Leche descremada (sin grasa)"skim" o "nonfat" ___ Crema agria sin grasa "fat-free" o "nonfat sourcream"
Queso normal	___ Queso sin grasa, o pequeñas cantidades de queso ligero o bajo en grasa, incluyendo ricotta y mozzarella semi descremado
Carne de res, cordero y puerco alta en grasa	___ Pescado magro (atún, pargo (*snapper*), bacalao, halibut) ___ Pollo y pavo casi todos los días de la semana (quite el pellejo de la carne de ave) ___ Comidas vegetarianas semanalmente ___ Cortes magros de carne roja (carne de res, algunos cortes son: "eye of round," "round tip," y "top of round" ___ Quítele la grasa visible a la carne ___ Carne molida de res y pavo, magra o extra magra (<7% grasa) ___ Elija carnes frías "bajas en grasa" o "99% libre de grasa"
Comidas fritas y refrigerios altos en grasa	___ Galletas, papas "horneadas" ___ Galletas, galletas y refrigerios "bajos en grasa" ___ Galletas y refrigerios "sin azúcar" (por lo general bajos en calorías) ___ Evite alimentos hechos con "aceites parcialmente hidrogenados"
Mayonesa y aderezo para ensalada	___ Mayonesa o aderezo "sin grasa" o "ligera" ___ Mostaza, salsa de tomate, y otros condimentos sin grasa
Huevos	___ Claras de huevos (2 claras = 1 huevo en recetas) o sustitutos del huevo
Jugo, sodas, bebidas endulzadas	___ Agua, bebidas sin azúcar, sodas dietéticas
Granos refinados (arroz blanco/pan)	___ Pan y cereales de "grano integrales": salvado de avena, harina de avena, arroz integral y blanco, pan de trigo integral al 100%, polenta, cebada, cebada, mijo (millet)
Comida rápida (hamburguesas, papas fritas, pollo frito)	___ Pollo a la parrilla sin pellejo, ensaladas

Gladstone Institute of Cardiovascular Disease
SFGH Lipid Clinic

飲食問卷調查 (Diet Questionnaire)

患者姓名：_____ 出生日期：_____ 日期：_____

誰爲閣下預備膳食？_____ 閣下家中由誰來購物？_____

使用何種烹飪方法？（勾出所有適用項）

❑ 烘焙 ❑ 烤 ❑ 炸 ❑ 燒烤 / BBQ ❑ 煮 ❑ 炒 ❑ 蒸

使用何種油或酥油？_____

閣下是否看食物標簽？ 是 / 否

閣下每週在外吃飯多少次？_____ 在何處吃飯？_____

閣下正餐之間是否吃零食？ 是／否 若是，閣下吃何種零食？_____

下列所列食物中，閣下每週吃多少次？

雞肉／火雞_____ 蛋類_____ 魚類_____ 紅肉（牛肉、羊肉、豬肉）_____ 素菜_____

閣下每天吃多少次家禽、蛋類、魚類或紅肉？_____

閣下是否吃乳製品（芝士、牛奶、酸乳酪）？ 是 / 否 請在下面列出種類及次數：

1) _____次數？_____ 2) _____次數？_____ 3) _____次數？_____

閣下是否吃甜食？ 是／否 請在下面列出種類及次數：

1) _____次數？_____ 2) _____次數？_____ 3) _____次數？_____

閣下是否吃水果及蔬菜？ 是／否 請在下面列出種類及次數：

1) _____次數？_____ 2) _____次數？_____ 3) _____次數？_____

閣下如何進行準備？_____

閣下每天食用多少次麵包、穀類食品、意粉及蕎麥食品？_____

閣下選擇飲用何種飲料？請在下面列出種類及次數（包括酒）：

1) _____次數？_____ 2) _____次數？_____ 3) _____次數？_____

閣下一天中最激烈的活動是什麼？_____次數？_____

閣下是否患有食物敏感症？ 是／否 閣下是否忌食某些食物？ 是／否

閣下是否有任何特殊飲食安排？ 是／否 請列明：_____

請列出閣下所服用的任何維他命或中草藥？_____

請列出閣下有意討論的任何具體疑慮：_____

患者簽名：_____

葛拉史東心血管疾病學會

食譜 (Diet Prescription)
僅遵守標記的飲食建議

所有患者：

____ **低飽和脂肪、反式脂肪及膽固醇食譜：**請參見補充材料

____ **運動：每週消耗 600 至 1,400 卡路里（每週 6 至 14 百卡路里；每天 1 至 2 百卡路里）**
研究顯示運動可降低發心臟病及死於心臟病的可能性。運動亦可降低甘油三酸脂的值及提高 HDL（良）膽固醇的值。

____ **每天食用五次或以上的水果及蔬菜**
研究顯示人們每天食用三次以上水果／蔬菜可降低導致死亡的所有誘因。

____ **魚類含豐富健康脂肪：每週兩次**
研究顯示人們每週食用至少兩次含豐富健康脂肪（EPA／DHA）的魚類可降低心臟病致死的可能性。

選擇：比目魚／鰨魚、大比目魚、鯡魚、鯖魚、虹鱒魚、大馬哈魚、沙丁魚

____ **甲亞油酸：每天 1.5 至 3 克**
研究顯示人們食用含豐富健康脂肪亞麻酸的食物及食用油可降低患心臟病的可能性。

選擇：
亞麻籽油，每天 1 茶匙
亞麻籽，碎末，每天 2 茶匙
菜籽油，每天 1 至 2 湯匙
核桃油，每天 1 至 2 湯匙
核桃，每天 2 至 4 盎司

____ **可溶性纖維：每天 10 至 25 克：**可溶性纖維有助於降低 LDL（不良）膽固醇。

選擇： 首先嘗試透過食物達到目標：全穀類、高纖維穀類食物、水果、蔬菜
若未達到目標，纖維補品可結合食物食用：
Metamucil，1 茶匙原味或 1 湯匙橙味 = 2 克可溶性纖維
Metamucil，2 塊纖維威化餅 = 3 克可溶性纖維

____ **植物固醇人造黃油：**植物固醇是植物中的化學物，有助於降低 LDL 膽固醇。

選擇：
Benecol light，1 湯匙。2 至 4 次／天。費用：~15 美元／月
Take Control light，1 湯匙。1 至 2 次／天。費用：~15 美元／月
Benecol Chews，1 咀嚼片，2 至 4 次／天。費用：~37 美元／月
Minute Maid Heart Wise 橙汁，1 8 盎司／杯。2 次／天。費用：~35 美元／月
CardioSterol 膠囊，2 粒。2 次／天。費用：~17 美元／月

高風險患者 — 僅遵醫囑服用

____ **EPA／DHA 魚油補品；每天 1 克：**研究顯示人們服用魚油補品可降低心臟病致死的可能性。

選擇（並非完整清單）： Carlson super omega-3（極品魚油）、GNC 預防性營養綜合品（preventive nutrition omega complex）、Kirkland（Costco）（3／天，費用：22 美元／年）、Nature's Bounty（由 Walgreens 提供）、Puritan's Pride 無膽固醇魚油、Sav-on Osco by Albertson's Natural 魚油、Vitamin Shoppe、Vitamin World、Whole Foods。

The Gladstone Institute of Cardiovascular Disease
葛拉史東心血管疾病學會

牛肉、豬肉、家禽及魚類的脂肪含量 (Fat Content of Meats)
除另有指明者外，均按 3 盎司烹飪量計算

	超瘦肉 0 至 5 克 (<2 克 SF)	瘦肉 6 至 10 克 (≤4.5 克 SF)	中脂肥肉 11 至 15 克	高脂肥肉 16 至 20 克	超高脂肥肉 20 克以上
牛肉		板腱 碎牛肉 （脂肪含量 7%） 碎小腿肉 上腿肉	後腿肉 腰窩肉 碎牛肉 （脂肪含 10%） 1 個熱狗 1 根香腸 上後腰肉 上腰肉	燉前肘肉 鹹牛肉 碎牛肉 （脂肪含量 20%） 上等腰肉牛排 裹脊牛肉 腰部嫩肉 丁骨牛排	
雞肉	胸肉（無皮）	胸肉（無皮） 1 個雞小腿（無皮） 碎雞肉 雞大腿（無皮） 1 個雞翅（無皮）	雞大腿（帶皮） 雞肉熱狗 1 個雞小腿（帶皮） 碎雞肉	1 個雞翅（帶皮）	
魚肉	鱸魚 竹莢魚 大比目魚 魚餅（2 片） 鱈魚 鮫鰉魚 河鱸 海鱸 鯊魚 甲魚 旗魚 金槍魚	鯰魚 大西洋鯡魚 鮭魚 太平洋鯖魚 大馬哈魚 銀大馬哈魚 紅大馬哈魚 石首魚	鰻魚 太平洋鯡魚 大西洋鯖魚 大馬哈魚 大西洋 奇努克		
羊肉			前小腿肉 整腿肉 腰肉 上部腰排	腿肉，半腿肉 腿肉，半上腰肉 碎羊肉 排骨 肩胛	
豬肉	大腿後部（超瘦） 腰部嫩肉	無骨上部腰肉 加拿大熏豬肉 大腿後部（普通） 烤肉 上部腰肉烤肉 上後腰肉烤肉	中部腰肉烤肉 腿肉，半臀部肉 整塊腰肉 豬排 烤排 肩胛排 上部腰排 上後腰排	肘火腿，肩肉 碎豬肉 腿肉，半腿肉 排骨 香腸 烤肩胛	大香腸 肝泥香腸 烤腰骨或肉排 肩胛卷 帶肉小排骨
火雞肉	胸肉（無皮） 黑肉（無皮） 碎火雞肉（脂肪含量 1%） 火雞熏肉，2 sl. 雞翅（無皮）	胸肉（帶皮） 黑肉（帶皮） 雞翅（帶皮） 碎火雞肉（脂肪含量 7%及 10%）	1 個火雞熱狗		
小牛肉	腿肉，上大腿肉	碎小牛肉 肩肘 肩胛 上部腰肉及腰肉	胸肉 胸排 排骨		

The Gladstone Institute of Cardiovascular Disease
葛拉史東心血管疾病學會

低飽和脂肪、反式脂肪及膽固醇食品
(Low Saturated Fat, Trans-fat and Cholesterol Diet)

研究顯示人們食用低飽和脂肪、反式脂肪及膽固醇食品可降低 LDL（不良）膽固醇水準。

限制食用以下食品：	可選替代品：
黃油	___ 人造黃油： Canoleo Soft 人造黃油、Canola Harvest 非氫化人造黃油、Benecol Light 人造黃油、Take Control Light 人造黃油。
	___ 食用油：亞麻籽油、菜籽油、核桃油、橄欖油
乳酪，全脂或脂肪含量 2%的乳製品	___ 脫脂牛奶（脫脂）或 1%牛奶脂肪
普通芝士	___ 低脂芝士：義大利乳清乾酪、義大利乾酪（part-skim mozzarella）及「低脂」芝士
高脂牛肉、羊肉及豬肉	___ 每週至少吃兩次魚 ___ 週中大部分時間吃雞肉及火雞肉 ___ 每週食用素食 ___ 紅瘦肉（牛腿肉、頸肉、上部腰肉、腰肉） ___ 瘦或超瘦碎牛肉或火雞肉（脂肪含量低於 7%） ___ *挑選或選擇*最少量肥瘦相間的肉。 ___ 剔除肉上可見的肥肉 ___ 選擇「低脂」、「99%脫脂」的三明治用肉 ___ 家禽去皮
蛋類	___ 蛋白（2 個蛋的蛋白 = 食譜中 1 個蛋） ___ 攪蛋器（其他蛋類替代品）
油炸食品及高脂零食	___ 「烤」餅、薄餅 ___ 「低脂」餅、曲奇及零食 ___ 「脫脂」曲奇及零食（通常卡路里含量較低） ___ 避免食用「部分氫化食用油」烹製的食品
蛋黃醬	___ 「脫脂」或「低脂」蛋黃醬 ___ 芥菜、調味番茄醬及其他無脂調味品
細糧	___ 「全穀」麵包及穀類食品：燕麥麩、麥片、野糙米、100%全麥麵包、大麥粥、粟米

The Gladstone Institute of Cardiovascular Disease

葛拉史東心血管疾病學會

三甘油脂含量介於 150 至 799 毫升／分升人士的飲食建議
(Diet Recommendations for Triglyceride Levels Between 150 and 799 mg/dL)

研究顯示三甘油脂含量介於 150 至 799 毫克／分升之間的人士食用適當碳水化合物食品（碳水化合物卡路里含量低於 50%）、避免飲用普通酒水可降低三甘油脂值。

限制食用以下食品：	可選代替品：
普通酒水（每天或每隔一天）	___ 水、無糖飲料、減肥蘇打水 ___ 不飲酒（最佳），但每週 1 至 2 次可接受
果汁、蘇打水、甜飲料	___水、無糖飲料、減肥蘇打水
大量食用麵包、意粉、米飯及穀類	___ 減少 1/3 的食用量
細糧（白米／麵包）	___「全穀」麵包及穀類食品：燕麥麩、麥片、野糙米、100%全麥麵包、大麥粥、粟米
碳水化合物零食（脆餅、餅乾、薄餅、曲奇）	___ 堅果、橄欖
穀類食品中加葡萄乾或糖	___ 堅果、亞麻籽

每天保持運動！

葛拉史東心血管疾病學會

三甘油脂含量超過 800 毫克／分升人士的飲食建議
(Diet Recommendations for Triglyceride Levels Above 800 mg/dL)

限制使用以下食品：	可選代替品：
酒水（完全不飲用）	___ 水、無糖飲料、減肥蘇打水
黃油、食用油	___烹飪：使用不粘平底鍋或平澆薄薄一層植物油，使用檸檬、橘子或番茄汁、香草、香料、水果或肉湯調味 ___三明治及沙律：使用辛辣芥菜、檸檬汁、香醋、鷹嘴豆泥或香料調味汁（salsa for flavor）
乳酪，全脂或脂肪含量 2%或 1%的乳製品	___ 脫脂牛奶（脫脂） ___ 脫脂優酪乳油
普通芝士	___ 脫脂芝士或少量低脂芝士，包括義大利乳清乾酪及義大利乾酪（part-skim mozzarella）
高脂牛肉、羊肉及豬肉	___ 魚瘦肉（金槍魚、甲魚、鱈魚、大比目魚） ___ 週中大部分時間吃雞肉及火雞肉（家禽除皮） ___ 每週食用素食 ___ 切割紅肉瘦肉（板腱、下牛腿肉、上牛腿肉） ___ 剔除肉上可見的肥肉 ___ 瘦或超瘦碎牛肉或火雞肉（脂肪含量低於 7%） ___ 選擇「低脂」、「99%脫脂」的三明治用肉
油炸食品及高脂零食	___「烤」餅、薄餅 ___「低脂」餅、曲奇及零食 ___「脫脂」曲奇及零食（通常卡路里含量較低） ___ 避免食用「部分氫化食用油」烹製的食品
蛋黃醬及沙律調料	___「脫脂」或「低脂」蛋黃醬或沙律調味品 ___ 芥菜、調味番茄醬及其他脫脂調味品
蛋類	___ 蛋白（2 個蛋的蛋白=食譜中 1 個蛋）或蛋替代品
果汁、蘇打水、甜飲料	___水、無糖飲料、減肥蘇打水
細糧（白米／麵包）	___「全穀」麵包及穀類食品：燕麥麩、麥片、野糙米、100%全麥麵包、大麥粥、粟米
速食（芝士漢堡、炸土豆片、炸雞）	___ 無皮烤雞、沙律

Институт сердечно-сосудистых болезней им. Гладстоуна

Рацион питания с малым потреблением насыщенных жиров, гидрогенизованных масел и холестерина

(Low Saturated Fat, Trans-fat and Cholesterol Diet)

Исследования показывают, что у людей, потребляющих малые количества насыщенных жиров, гидрогенизованных масел и холестерина, снижается уровень содержания липопротеина низкой плотности (LDL) – "плохого" холестерина.

Ограничить потребление следующих продуктов:		**Варианты заменяющих продуктов:**
Сливочное масло	___	Маргарины: мягкий маргарин Canoleo, негидрогенизованный маргарин Canola Harvest, маргарин Benecol Light, маргарин Take Control Light
	___	Растительные масла: льняное, канола, ореховое, оливковое
Сливки, цельные или молочные продукты 2%-й жирности	___	Снятое молоко (обезжиренное) или 1%-е молоко
Обыкновенный сыр	___	Маложирный сыр: рикотта, моцарелла из частично снятого молока и сыры, на которых указано, что они являются маложирными (Low-fat)
Жирная говядина, баранина и свинина	___	Рыба не реже двух раз в неделю
	___	Цыплята и индейка большинство дней недели
	___	Вегетарианские блюда каждую неделю
	___	Постные куски красного мяса (огузок, бескостная часть тазобедренного отруба, тонкий край, вырезка)
	___	Постный и особо постный фарш из говядины и индейки (жирность <7%)
	___	Мясо отборных сортов *Choice* или *Select* с минимальной мраморностью
	___	Удаление видимых прослоек жира на мясе
	___	Мясные полуфабрикаты типа "маложирное" (Low-fat), "обезжиренное на 99%" (99% fat-free) для бутербродов
	___	Удаление кожи с птицы
Яйца	___	Яичные белки (белки 2 яиц = 1 яйцу в рецептуре)
	___	Яичный продукт Egg Beaters (или другие заменители яиц)
Пищевые продукты, приготовленные во фритюре, и закуски с высоким содержанием жиров		
	___	Печеные(марки Baked) крекеры, чипсы
	___	Маложирные (Low-fat) крекеры, печенье и закуски
	___	Не содержащее сахара (Sugar-free) печенье и закуски (обычно пониженной калорийности)
	___	Избегать пищевых продуктов, приготовленных с использованием частично гидрогенизованных масел
Майонез	___	Обезжиренный (Fat-free) или легкий (Light) майонез
	___	Горчица, кетчуп и другие заправки, не содержащие жиров
Изделия из зерна высокой степени очистки		
	___	Хлеб и хлопья из цельного зерна (Whole-grain): овсяные отруби, овсяная мука, коричневый и дикий рис, хлеб из 100% цельной пшеницы, полента, пшено

Viện Tim mạch Gladstone

Chế độ ăn uống ít chất béo bão hoà, chất béo dạng trans và ít choleslerol

Các nghiên cứu đã chứng minh rằng những người có chế độ ăn uống ít chất béo bão hoà, chất béo dạng trans và ít cholesterol làm giảm được lượng cholesterol LDL (không tốt cho sức khỏe) trong máu.

Hạn chế dùng những thức ăn sau:	**Các lựa chọn thay thế:**
Bơ	___ Bơ thực vật: bơ mềm Canoleo, bơ Canola không bị hydro hoá, bơ Benecol nhẹ, bơ Take Control Light ___ Dầu: dầu hạt lanh, canola, quả óc chó, dầu oliu
Kem, tất cả hoặc các sản phẩm sữa béo 2%	___ sữa gầy (không béo) hay sữa béo 1%
Phomát thông thường	___ pho mát ít béo: phomát ricotta, pho mát gầy mozzarella, và nói tóm lại là "ít béo"
Thịt bò, thịt cừu và thịt lợn có nhiều chất béo	___ Ăn cá ít nhất hai lần một tuần ___ Gà và gà tây hầu như cả tuần ___ Các bữa ăn chay hàng tuần ___ Ăn phần thịt nạc có màu đỏ (thịt bắp, thịt vai, thăn bò, thịt lưng bò) ___ Thịt bò và thịt gà tây xay nạc hay siêu nạc (dưới 7% chất béo) ___ Chọn loại thịt có ít mỡ ___ Thịt mua về lóc bỏ mỡ ___ Chọn thịt kẹp sandwich "ít béo", "không béo tới 99%" ___ Lóc bỏ da gia cầm
Trứng	___ Lòng trắng trứng (2 lòng trắng trứng = 1 suất trứng) ___ Dùng que đánh trứng (hoặc các sản phẩm thay thế trứng)
Các thực phẩm rán và các món snack nhiều chất béo	___ Bánh quy giòn "nướng", khoai tây rán ___ Bánh quy giòn, bánh quy và snack "ít béo" ___ Bánh quy và snack "không đường" (thường có lượng calo ít hơn) ___ Tránh ăn những thực phẩm được làm từ "*dầu ăn phần nào đã bị hydro hoá"*
Sốt Mayonnaise	___ Sốt mayonnaise "không béo" hoặc "nhẹ" ___ Mù tạt, sốt cà chua và những gia vị không béo
Ngũ cốc tinh lọc	___ Bánh mì và ngũ cốc "nguyên cám": cám yến mạch, cháo yến mạch, gạo lứt và gạo tấm, bánh mì làm bằng lúa mì 100%, cháo ngô, hạt kê

New Diabetes Tools and Resources

Elizabeth Murphy, MD, DPhil

How Low to Go?

What are Appropriate Glycemic Targets in Diabetes?

Making It Work CME
May 6 , 2011
Elizabeth J. Murphy, MD, DPhil

1

Diabetes in 1940s and 50s

- Mortality and Morbidity
  - 1/3 of patients died within 25 y of dx
  - Newly dx 30 y old, life expectancy 60 y
  - 25% developed renal failure and 90% developed retinopathy within 25 y
- Goals
  - Prevent hospitalization and death
    - DKA
    - Hyperosmolar Coma
    - Severe hypoglycemia

2

The Queen of Pee

- 1956 with her husband Al Free developed dry reagents for urinalysis (CLINSTIX)
- Made at home monitoring of glucose control possible for the first time
- Led to a test strip to measure glucose in the blood

3

First Glucometer - Ames Reflectance Meter

- Introduced 1971
- For use in doctors office only
- Used a Dextrostix strip
- Originally some strong opposition from clinicians/ADA
- Allowed for the first time accurate home determination of blood glucose levels

4

1980s

- Patient friendly glucometers available
- 1986 ADA recommended glucometer use for insulin users
- Began seeing more widespread use of HbA1C in DM

TIGHT CONTROL TRIALS

- 1977 - Start of UKPDS
- 1983 - Start of the DCCT

5

Diabetes Control and Complications Trial - *DCCT*

- DCCT 1983-1993, 99% completion
- EDICT 1993-present, >90% followed
- 1441 DM1, age 27, 5-6 yrs after dx
- Primary Outcome
  - Primary and secondary prevention of retinopathy
- Secondary Outcome
  - Nephropathy, neuropathy, CV, neuropsych and neurcognitive effects

New England Journal of Medicine, 329(14), September 30, 1993.

6

DCCT - *WHO?*

- 1441 T1DM volunteers
- Age 13-39 (average age 27 y)
- Duration of disease 1-15 years (average 5-6 y)
- Normal blood pressure and lipids
- No severe complications
- Mean follow-up 6.5 y
- 99% of patients completed the study
- Ave A1C 8.9% at start of trial

New England Journal of Medicine, 329(14), September 30, 1993. 7

DCCT - *Conventional Therapy*

- Conventional therapy
  - Insulin QD or BID
  - Daily urine or blood glucose monitoring
  - Diet and exercise education
- Goals
  - Absence of symptoms of glycosuria or hyperglycemia
  - Absence of ketonuria
  - Maintenance of normal growth, development and ideal body weight
  - Avoidance of severe or frequent hypoglycemia
- Results
  - A1C 9.1%
  - Mean glucose 231 mg/dl

New England Journal of Medicine, 329(14), September 30, 1993. 8

DCCT - *Tight Control*

- Tight Control
  - Insulin 3+ times a day or pump
  - SMBG 4+ times a day
  - Continual dosage adjustment based on food and exercise
- Tight control goal
  - HA1C within the normal range (< 6.05%)
  - Preprandial glucose 70-120 mg/dl
  - Postprandial glucose < 180 mg/dl
  - Weekly 3 am glucose > 65 mg/dl
- Results
  - A1C 7.2%
  - Mean glucose 155 mg/dl

New England Journal of Medicine, 329(14), September 30, 1993. 9

DCCT - *Outcomes, 6.5 y f/u*

- 76% reduction in risk for development of retinopathy
- 54% reduction in risk of progression of retinopathy
- 39% reduction in risk of new microalbuminuria
- 54% reduction in risk of albuminuria
- 60% reduction in neuropathy
- No significant reduction in macrovascular disease (41% reduction, NS)

New England Journal of Medicine, 329(14), September 30, 1993.

10

DCCT *Impact on Care*

- Second Standards of Care for Diabetes (1994)
- Provided clear Glycemic Targets for IDDM
  - HbA1c goal < 7 %
    - action for < 8%
  - Preprandial BS goal 80-120
    - Action <80 or > 140
  - Bedtime BS goal 100-140
    - Action < 100 or > 160
  - Frequent BS monitoring
- "Reasonable to employ the same goals for NIDDM"

11

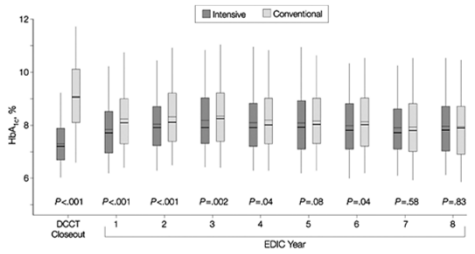
EDIC - Epidemiology of Diabetes Intervention and Complications

- 1993-present
- NIH funded
- At completion of DCCT all subjects offered intensive therapy
- All patients transferred care to own MDs
- Continued to follow > 90% of subjects

New England Journal of Medicine, 353(25), December 22, 2005.

12

EDIC - HbA_{1C} over time



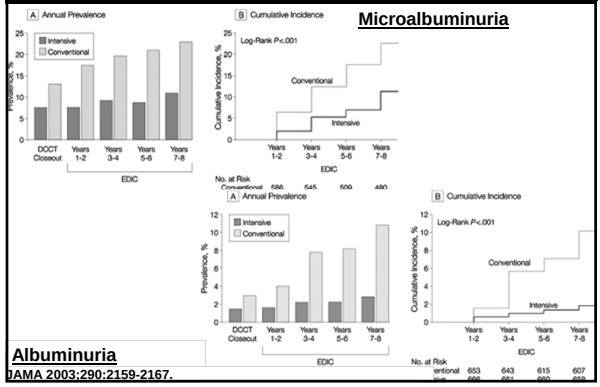
[1]Mean HbA1c through 10 years of EDIC:
8.07% conventional group
7.98% intensive group

JAMA 2003;290:2159-2167. [1]Arch Ophthalmol 2008;126:1707-1715.

13

DCCT/EDIC - *Prevalence and Incidence of Albumin Excretion*

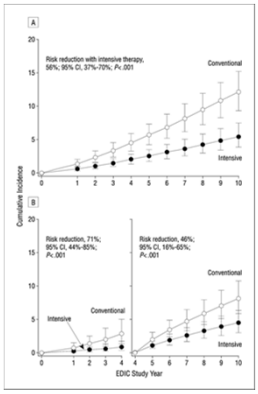
Microalbuminuria



Albuminuria

JAMA 2003;290:2159-2167.

DCCT/EDIC - *Cumulative Incidence of PDR*



- Risk reduction lasts through 10 years but may be waning
- At end of DCCT 71% of intensive group and 82% of control group had some form of retinopathy
- At year 12 of EDIC, 89% of intensive group and 97% of control group had some form of retinopathy

Arch Ophthalmol 2008;126:1707-1715.

DCCT/EDIC - *Intensive Diabetes Treatment and CVD in DM 1*

- Primary CVD outcome, composite of time to first:
  - Nonfatal MI or stroke
  - Death from CVD
  - Subclinical MI (found on annual ECG)
  - Angina confirmed by abnormal ETT or cath
  - Angioplasty or CABG.
- Mean follow-up of 11 years after the end DCCT (17 y total)
- Equal use of statins (33%), aspirin (40%), ACE-I/ARB (40%)
- More beta-blocker use in the conventional group (7 v 3%)

N Engl J Med 2005;353:2643-2653

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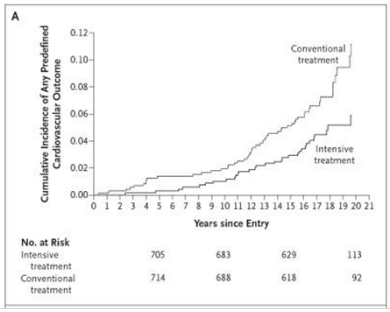
DCCT/EDIC-*Cumulative Incidence CVD Outcomes*

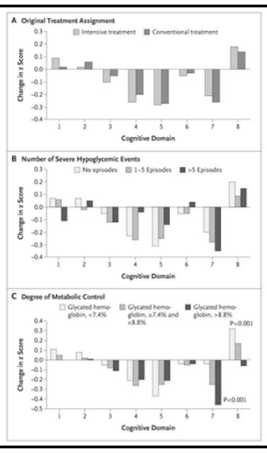
42% reduction in CVD risk
57% reduction in risk of nonfatal MI, stroke or CVD death



N Engl J Med 2005;353:2643-2653

Long-Term Effect of Diabetes and Its Treatment on Cognitive Function

18 year Follow-Up
(DCCT entry to y 12 EDIC)



N Engl J Med 2007;356:1842-1852

DCCT/EDICT *Major Findings*

- Tight glucose control in type 1 diabetes (7.2 v 9.1%) results in risk reduction in the development and progression of microvascular disease
- Legacy effect ("metabolic memory") of tight control on risk reduction for microvascular disease persists for 10 or more years
- Tight glucose control early in the course of disease results in significant CVD benefit many years after the intervention - an effect not observed at the completion of tight control

19

United Kingdom Prospective Diabetes Study - *UKPDS*

- 1977-1997, DM2
- 1997-2007, extended f/u with78% participating
- Median f/u 17-18 yrs
- 4209 newly diagnosed patients with T2DM
  - 3 months diet instruction
  - FBG 108-270 mg/dl
- Median age 54 y
- Ave A1C 7.1%
- 21 Predefined clinical endpoints
- 10-11 y f/u

Lancet, 1998; 352:837-853.

20

UKPDS -*Treatment Randomization*

- ≤ 120% of IBW Randomly assigned to either:
  - Insulin
  - Sulfonylurea (chlorpropamine or glibenclamide/glipizide)
  - Diet (conventional treatment)
- > 120% IBW Randomly Assigned to either:
  - Insulin
  - Sulfonylurea (chlorpropamide or glibenclamide)
  - Metformin
  - Diet (conventional treatment)
- Insulin
  - Started on ultralente QD
  - If on more than 14 units a day or pre-meal/HS BS > 126 mg/dl
    - Add R
    - Home glucose monitoring

Lancet, 1998; 352:837-853.

21

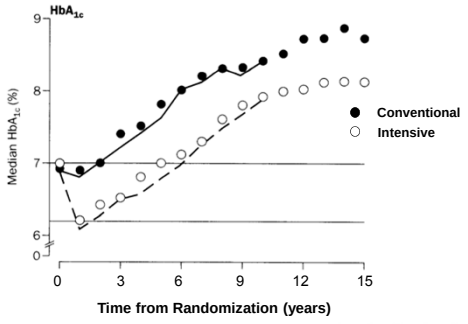
UKPDS - *Treatment Goals*

- Conventional Therapy
  - FPG < 270 mg/dl
  - No symptoms of hyperglycemia
  - Diet instruction from a dietician
- Intensive Therapy
  - FPG < 108 mg/dl
  - Premeal glucose 72-126 mg/dl
- Results
  - A1C 7.0 vs 7.9%
- Follow-up
  - Care by PCP with goal of lowering glucose/BP as much as able
  - Differences in glucose control gone by 5 y
  - 50% on insulin, 5% diet alone

Lancet, 1998; 352:837-853.

22

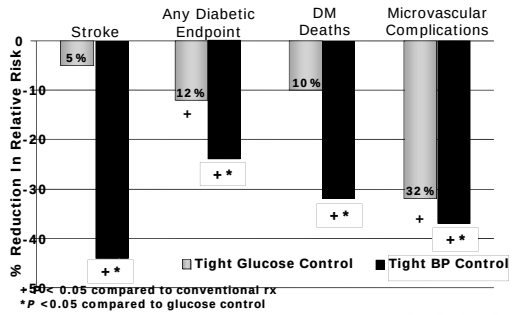
UKPDS - HbA_{1c} Progression



Lancet, 1998; 352:837-853.

23

Tight Glucose vs Tight Blood Pressure Control in the UKPDS



Turner RC, et al. BMJ. 1998;317:703-713.

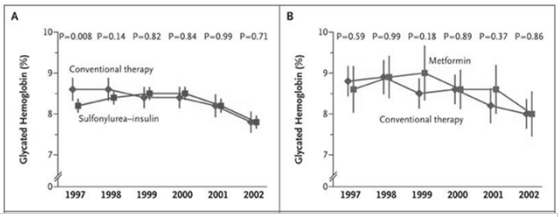
24

UKPDS *Major Findings*

- Tight glucose control (7.0 v 7.9%) in T2DM reduces the risk for microvascular complications and any diabetes-related endpoint
- No significant reductions were seen for all cause mortality (6% reduction, NS), diabetes related death (10% reduction, NS) or other CV endpoints
- Tight blood pressure control (154/87 v 144/82) in T2DM reduced the risk of microvascular complications, macrovascular complications (e.g. strokes) and saves lives
- Tight glucose control with metformin (7.4 v 8.0%) reduced the risk of death, diabetes related death, and any diabetes-related endpoint

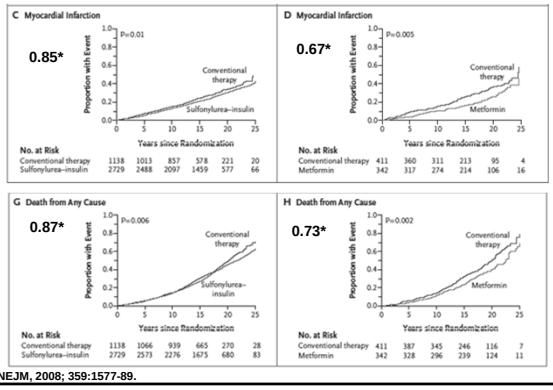
25

UKPDS - *10 y Follow-Up*



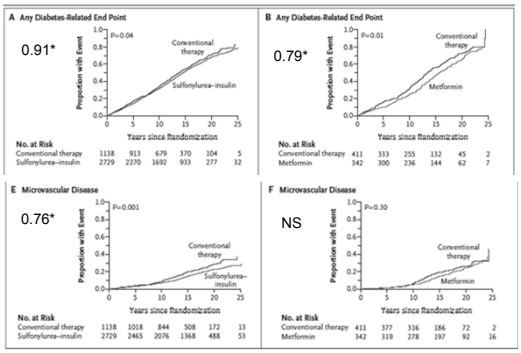
NEJM, 2008; 359:1577-89.

UKPDS
10 y follow-up Intensive Glucose Control



NEJM, 2008; 359:1577-89.

UKPDS
10 y follow-up Intensive Glucose Control



NEJM, 2008; 359:1577-89.

UKPDS Follow-Up

- Despite an early loss of glycemic differences between groups, a continued reduction in microvascular risk and emergent risk reductions for MI and death from any cause were observed during 10 years of post-trial follow-up
- A continued benefit with initial metformin therapy was evident among overweight patients with substantial risk reductions for MI and death
- Loss of differences in blood pressure in post-trial follow-up were ***not*** associated with sustained benefits in diabetes-related end points, diabetes-related death, microvascular disease or stroke[1]

NEJM, 2008; 359:1577-89. [1]NEJM, 2008; 359:1565-76.

29

UKPDS *Impact on Care*

- ADA modified A1C recommendations for DM1 and DM2 (2002)
  - Develop or adjust the management plan to achieve normal or near-normal glycemia with an A1C goal of ≤7%.
  - Less stringent treatment goals may be appropriate for patients with limited life expectancies, in the very young or older adults, and in individuals with comorbid conditions.

30

Goals in 2008

- ADA A1C recommendations for DM1 and DM2 (2008)
  - Lowering and A1C to an average of 7% has clearly been shown to reduce microvascular and neuropathic complications and possibly macrovascular disease. A1C goal for nonpregnant adults in general is < 7%.
  - Studies suggest .. Benefit to lowering A1C from 7%... the A1C goal for selected individuals patients is as close to normal (<6%) as possible without significant hypogylycemia.
  - Less stringent A1C goals may be appropriate for patients with a history of severe hypoglycemia, limited life expectancies, childern, in individuals with comorbid conditions, and longstanding diabetes with minimal or stable microvascular complications.
- AACE goal A1C < 6.5%
- IDF goal A1C < 6.5%

31

Action to Control Cardiovascular Risk in Diabetes - *ACCORD*

- Sponsor: NIH, CDC; North America
- High risk CVD
- Primary Outcome
  - Major CVD event (heart attack, stroke or CV death
- Intensive Glycemic Control
  - Start with ≥ 2 oral agents + diet/lifestyle
  - Increase dosage or add another agent if:
    - A1C ≥ 6.0%; > 50% premeal SMBG > 100 mg/dl; > 50% 2 hr postmeal SMBG > 140 mg/dl
  - 70% of patients on 3 or more oral agents; 91% on TZD (rosi); 77% on insulin
- Conventional Glycemic Control
  - Start with diet/lifestyle
  - Action for A1C > 7.9% or < 6.5%
  - < 35% of patients on 3 or more oral agents; 58% on TZD (rosi; 55% on insulin

N Engl J Med 2008;358:2545-2559.

32

Action in Diabetes and VAscular disease: preterax and diamicron modified release Controlled Evaluation *ADVANCE*

- Sponsor: Servier, NH and MRC Australia; 20 countries (Asia, Australia, Europe)
- Age ≥ 55 with history of major macro or microvascular disease or at least one other RF for vascular disease
- Primary Outcome
  - Composite of microvascular
  - Composite of macrovascular (CV death, MI, stroke)
  - Combined composite
- Intensive Glycemic Control
  - Rx glicazide
  - Accelerate per MD for A1C > 6.5
  - 90% on glicazide; 7% on 3 oral agents; 17% on TZD; 41% on insulin
- Conventional Glycemic Control
  - Standard rx based on local glycemic targets
  - 57% on another; 5% on 3 oral agents; 11% on TZD, 24% on insulin

NEJM, 2008; 358:2560-72.

33

VA Diabetes Trial - *VADT*

- Sponsor: VA, ADA, pharma; 97% male
- Inadequate response to max dose oral or on insulin; High Risk CVD; Excluded A1C < 7.5%; 52% on insulin at baseline
- Primary Outcome
  - Major CVD event
- For ALL Patients
  - BMI > 27 started on metformin and rosiglitazone
  - BMI < 27 started on glimepiride and rosiglitazone
  - >80% of patients in both groups on rosiglitazone
- Intensive Control
  - Started on maximal doses
  - Insulin added if A1C ≥ 6%
- Conventional Glycemic Control
  - Started on on half maximal doses
  - Insulin added if A1C ≥ 9%
- Subsequent changes made by local assessment with help from guidelines

N Engl J Med 2009;360:129-39.

34

T2DM Trials
Subject Comparison

	UKPDS	ADVANCE	ACCORD	VADT
# subjects	4,209	11,140	10,251	1,791
Age (y)	54	66	62	60
BMI	27.5	28.0	32.2	31.2
Dx (y)	New	8	10	11.5
A1C %	7.1	7.5	8.3	9.4

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T2DM Trials
Baseline Complications Comparison

	UKPDS	ADVANCE	ACCORD	VADT
Any retinopathy	36%	-	-	62%
Severe eye dz	-	7%	-	6%
Macroalb	2%	3.5%	-	19%
Microalb	12%	27%	-	29%
CVD	7.5%	32%	35%	40%

36

T2DM Trials
A1C Lowering Comparison

	UKPDS	ADVANCE	ACCORD	VADT
Starting A1C%	7.1	7.5	8.3	9.4
Goal A1C%	-	≤ 6.5	< 6.0	-1.5
Int. A1C%	7.0	6.4	6.4	6.9
Ctrl A1C%	7.9	7.0	7.5	8.4
Duration of Follow-up	10+10= 20	5.0	3.4	5.6

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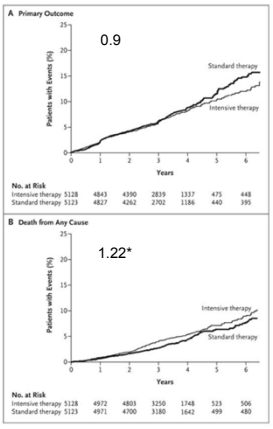
ACCORD OUTCOMES

- Significant increase in all cause death and CVD disease (1.35 RR) death
- Significant decrease in nonfatal MI (0.76 RR)
- No significant reduction in primary outcome, NS increases in CHF in intensive group
- Did better with no h/o CVD, A1C < 8%



N Engl J Med 2008;358:2545-2559

NOT the reasons for increased mortality in ACCORD

- Hypoglycemia
- Rapid drop in A1C
- Lower A1C
- Rosiglitazone use

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ACCORD – *Effect on Retinopathy*

- After 4 years of therapy
  - 7.3% progression of diabetic retinopathy in intensive glycemic control arm
  - 10.4% progression in standard therapy arm
- OR 0.67 p=0.003

NEJM, 2010; 363:233-244

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Advance -*Treatment Randomization*

- BP randomization
  - indapamide/perindopril combo (PRETERAX)
  - placebo
- Intensive Glycemic Control
  - Rx glicazide and stop other SUs
  - Accelerate per MD for A1C > 6.5
  - 90% on glicazide
  - 7% on 3 oral agents
  - 17% on TZD, 41% on insulin
  - A1C 6.4%
- Conventional Glycemic Control
  - Standard rx based on local glycemic targets
  - 57% on another SU (switched at baseline from glicazide)
  - 5% on 3 oral agents
  - 11% on TZD, 24% on insulin
  - A1C 7.0%

NEJM, 2008; 358:2560-72.

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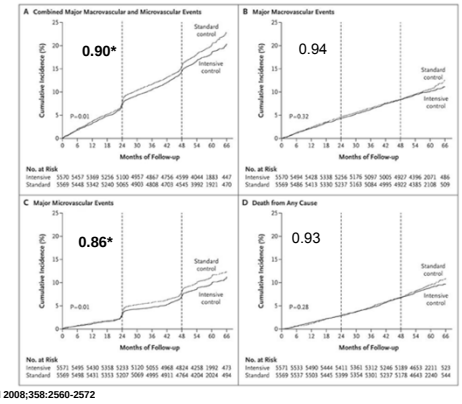
ADVANCE - *Outcomes*



N Engl J Med 2008;358:2560-2572

ADVANCE

- 10% relative reduction in the combined outcome of major macrovascular and microvascular events, primarily as a consequence of a 21% relative reduction in nephropathy
- Most significant finding was intensive glucose control significantly reduced the risk of renal events, HR 0.79 (0.66-0.93)
- Benefit seen for development of macroalbuminuria and trend toward reduction in need for dialysis/transplant or renal death
- There was no significant difference between the two groups in overall mortality or macrovascular events, however a trend appeared to be emerging

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VADT - *Treatment Randomization*

- For All Patients
  - BMI > 27 started on metformin and rosiglitazone
  - BMI < 27 started on glimepiride and rosiglitazone
  - >80% of patients in both groups on rosiglitazone
- Intensive Control
  - Started on maximal doses
  - Insulin added if A1C ≥ 6%
  - A1C 6.9%
- Conventional Glycemic Control
  - Started on on half maximal doses
  - Insulin added if A1C ≥ 9%
  - A1C 8.4%
- Subsequent changes made by local assessment with help from guidelines

N Engl J Med 2009;360:129-39.

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VADT
CV Risk Factors at Trial Completion

	Standard Therapy	Intensive Therapy
BP	125/69	127/68
LDL	80	80
HDL	41	40
TG	159	151
Statin	83%	86%
Anti-Plt	91%	94%

Predicted event rate 40.0%, actual 33.5%.

N Engl J Med 2009;360:129-39.

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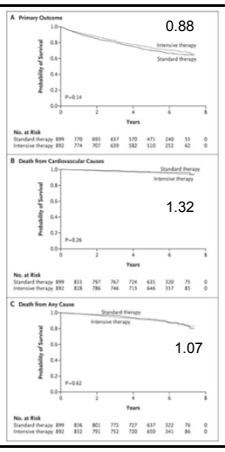
VADT - *Outcomes*

- No significant difference in primary outcome or death
- Decrease in progression of albuminuria (4.1 v 6.6%, p =0.05)
- Trend toward decrease in 2 step progression in severity of eye disease (p=0.07)
- Trend toward increase in sudden death (p=0.08)
- No other differences in were observed for microvascular complications or other secondary CV measures



N Engl J Med 2009;360:129-39.

Steno-2

- 1993-2001, Danish Health RC
- 160 white patients with DM2 and microalbuminuria
- Multi-factorial tight control
  - A1C < 6.5%
  - TC < 175 mg/dl
  - TG < 150 mg/dl
  - BP < 130/80 (all got ACE-I or ARB)
  - Low dose ASA
- Tight control for 7.8 y with 5.5 y post trial f/u (13.3 total follow up)
- Treatment with MF/SU then insulin
- Follow-up Trial
  - Primary end point - death from any cause
  - Secondary end points
    - Nephropathy, Retinopathy,Neuropathy

NEJM 2008, 358:580-91; NEJM 2003, 348:383-93.

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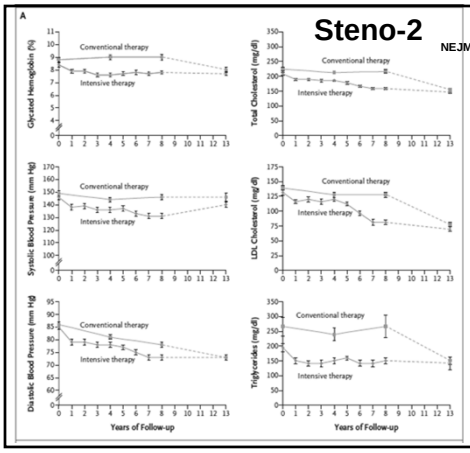
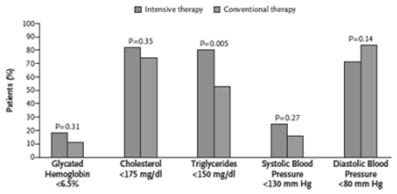
Steno-2



NEJM 2008; 358:580-92.

Steno-2 -
Percent of Patients Achieving Goals



NEJM 2008; 358:580-92.

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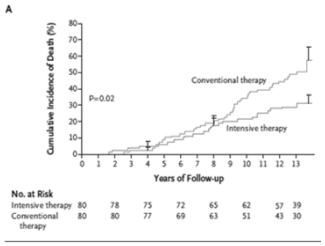
Steno-2 -
Cumulative Incidence of Death



NEJM 2008; 358:580-92.

Steno-2

- 50% mortality in the conventional treatment group
- 20% absolute risk reduction of all cause mortality
- 59% relative risk reduction CV events
- 29% absolute risk reduction in CV events
- Reductions in microvascular complications were seen after 3.8 y and persisted
- Despite no further differences in RF, risk of disease continued to diverge at 13 y f/u
- Despite not attaining predetermined goals, large benefits were seen with attempts at multifactorial risk reduction

NEJM 2008; 358:580-92.

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Conclusions - New Trials

- Event rates in recent trials were lower than expected suggesting improved cardiac RF modification in these high risk populations
- Large differences in treatment between the trials (e.g. TZD use, rapidity of A1C change) and not yet clear if differences in results in part due to those differences
- Early mortality with tight control in high risk CVD patients in one study a concern but significance unclear
- More publications are forthcoming that should clarify these differences
- Time is needed to know the long term effect of these interventions so the final answer isn't in yet

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Conclusions

- With respect to microvascular complications all data suggest the lower the better
- With respect to macrovascular complications, factors such as hypertension and dyslipidemia play a far larger role in morbidity and mortality.
- Accordingly, any benefits to be found with glycemic control will likely be small in comparison
- Aggressive treatment in early disease has long lasting micro and macrovascular benefits
- Keep-up aggressive BP lowering
- We will have to await longer follow-up to know the final results of ongoing large CVD trials

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ADA recommendations for DM1 and DM2 In 2011

- Lowering and A1C to below or around 7% has been shown to reduce microvascular and neuropathic complications and if implemented soon after diagnosis of diabetes is associated with long-term reduction in macrovascular disease. A reasonbale A1C goal for many nonpregnant adults is < 7%.
- Because additional analyses from several randomized trials suggest .. benefit in microvascular outcomes with A1C values closer to normal, providers might reasonably suggest more stringent A1C goals for selected individual patients, if this can be achieved without significant hypoglycemia or other adverse effects of treatment. Such patients might include those with short duration of diabetes, long life expectancy, and no significant CVD.
- Less stringent A1C goals may be appropriate for patients with a history of severe hypoglycemia, limited life expectancy, advanced micro or macrovascular complications, extensive comorbid conditions, and those with longstanding diabetes in whom the general goal is difficult to attain despite DSME, appropriate glucose monitoring, and effective doses of multiple glucose-lowering agents including insulin.

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In 2011

- Diabetes remains the leading cause in the U.S. of
  - New cases of blindness
  - Kidney failure and dialysis
- Non-traumatic amputations
- 18.8 million people in the US have diabetes (8.3% of the population)
- 7 million of those people are undiagnosed
- 79 million people have prediabetes
- At current rates 1 of every 3 kids born in California today will develop diabetes

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Supporting Your Patients:
Moving from oral agents to insulin

Amalia Fyles, RN, MSN, CNS, CDE, Elissa Hallen, RN, CDE,
Charlotte Kuo, NP, and Audrey Tang, FNP

Inspiring Motivation for Behavioral Change

Susan Scheidt, Psy.D.
Clinical Professor, UCSF
School of Medicine
Department of Psychiatry
San Francisco General Hosp

May 6, 2011

Goals for Today

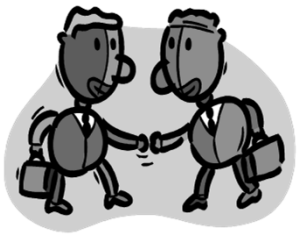
- Identify barriers to behavioral change
- Offer creative solutions for inspiring behavioral change in your patients
- Inspire you to maintain hope for your patients…and to renew yourself along the way!

Motivational Interviewing

- "I've already heard about it"
- "It's something I already do"
- What is it, anyway?

The Spirit of Motivational Interviewing

- Collaborative



Evocative

Honors Patient Autonomy

Guiding Principles: RULE

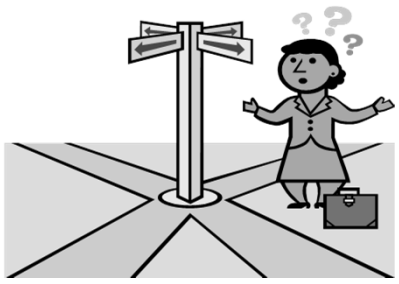
- R: Resist the Righting Reflex
- U: Understand Your Patient's Motivations
- L: Listen to Your Patient
- E: Empower Your Patient

Who is"Unmotivated"?

- List 3 behaviors you have ever tried to change
- Did you succeed in changing all of them?
- If not…WHY?

"Assume Good Intent"

Acknowledge Ambivalence



Communication Approaches

- Direct

Follow

- Guide

Stages of Change

(Prochaska and DiClemente, 1982, 1984, 1986)

- Precontemplation
- Contemplation
- Preparation
- Action
- Maintenance
- Relapse

The Challenges of Change

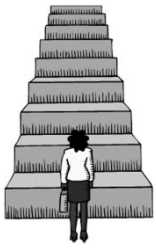
Change Talk

- DARN!

- Desire
- Ability
- Reasons
- Need

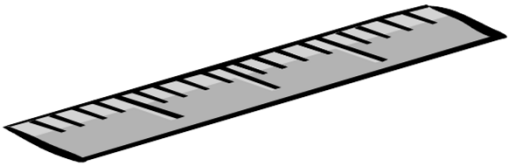
Moving Toward Change

- Commitment
- Taking Steps



Assessing Readiness

- Importance + confidence= Readiness for change



Decisional Balance

Weighing Pros and Cons

Key Questions: What Next?

- So, what do you make of all of this?
- What do you think you'll do?
- So what are you thinking about exercise at this point?
- What, if anything, do you plan to do?

Helpful Concepts

- Slow down and progress can be quicker!
- Consider the broader priorities of the patient
- Offer choices
- Talk about what others do
- Positive messages matter!

A Message of Hope in 60 Seconds

Resources

- Rollnick, S., Miller, W., Butler, C. (2008). *Motivational Interviewing in Health Care,* New York: Guilford Press.
- Miller, W.R., & Rollnick, S. (2002). *Motivational Interviewing: Preparing people for chance* (2nd ed.). New York: Guilford Press.
- Rollnick, S., Mason, P., Butler, C. (1999). *Health Behavior Change: A Guide for Practitioners.* Edinburgh: Churchill Livingstone.
- www.motivationalinterview.net

Summary: A Bouquet

- Consciously work to listen to patient's desires
- Understand ambivalence
- Reinforce change talk
- Find inspiration in small changes
- Remember, change is tough, and we're all on this journey together!

Thinking Outside the Box:
Beyond the traditional 1:1 patient visit

David Lown, MD

Improving Panel Management: Using your data

Elizabeth Johnson, MD and Lisa Golden, MD

MEDICAL ASSISTANTS: what can they do? What can't they do?

From the website of the Medical Board of California

What Medical Assistants CAN do	What Medical Assistants CAN'T do
Administer or inject any medication EXCEPT ANESTHETICS by IM, SQ or intradermal May inject narcotics or insulin. All medications must be verified by a licensed professional	Place the needle or start and disconnect the infusion tube of an IV. Administer IV medications Administer chemotherapy
Perform common in-office lab tests: glucose, urine dip, pregnancy test, etc	Insert a urinary catheter
Perform nasal and throat swabs	Injecting collagen or using lasers to remove hair, wrinkles, scars, moles or other blemishes
Take blood pressure	Chart pupillary responses.
Remove splints and casts	Apply splints and casts
Call in prescription refills to a pharmacy	Make changes to the dose or quantity when calling in refills to a pharmacy
Perform hearing tests	Interpret abnormal results from a hearing test
Administer flu shots or other vaccinations	
Order labs or diagnostics by standing order (e.g. A1c, mammograms)	
Perform diabetic foot exams	
Teach patients to use glucometers and how to inject insulin (must not select dose of insulin; but may demonstrate with saline or dose verified by clinician).	
Call patients and inform them of normal lab results	Independently perform telephone triage
Heath coaching, including self-management goals	Diagnose and prescribing treatment plans
Perform retinal eye exam using a camera	
Medication reconciliation (identifying mismatches between patient lists and provider list)	Recommend changes in medication doses
Pre-visit work: agenda-setting, chart-scrubbing, managing standing orders, assessing smoking status, performing assessments for depression, readiness to quit smoking, anxiety, etc.	Triage; management of abnormal screening results unless under standing order
Post-visit work: coaching patients on Visit Summaries, reinforcing provider recommendations for medication changes.	Change Visit Summary recommendations
Inter-visit work: calling patients to follow-up on self-management goals, care coordination of referrals, giving normal lab results, informing them of provider recommendations due to abnormal lab results	Analyze data or making diagnostic decisions

White areas are commonly performed tasks of medical assistants in clinics, allowed under Medical Board guidelines. Shaded areas are explicitly allowed or prohibited on the Medical Board website.

Detailed information from the website of the Medical Board of California
http://www.medbd.ca.gov/allied/medical_assistants_questions.html#21

Define acceptable and appropriate training to practice as a medical assistant.

Prior to performing technical supportive services, a medical assistant shall receive training, as necessary, in the judgment of the supervising physician, podiatrist or instructor to assure the medical assistant's competence in performing that service at the appropriate standard of care.

Such training shall be administered in either of the following settings: 1) Under a licensed physician or podiatrist, or under a registered nurse, licensed vocational nurse, a physician assistant or a qualified medical assistant, or 2) in a secondary, post secondary, or adult education program in a public school authorized by the Department of Education, in a community college program provided for in the Education Code, or a post secondary institution accredited or approved by the Bureau for Private Postsecondary and Vocational Education in the Department of Consumer Affairs.

To administer medications by intramuscular, subcutaneous and intradermal injections, to perform skin tests, or to perform venipuncture or skin puncture for the purposes of withdrawing blood, a medical assistant shall complete the minimum training prescribed in the regulations. Training shall be for the duration required by the medical assistant to demonstrate to the supervising physician, podiatrist, or instructor, as referenced in 16 CCR Section 1366.3 (a)(2), proficiency in the procedures to be performed as authorized by section 2069 or 2070 of the code, where applicable, but shall include no less than:

- 10 clock hours of training in administering injections and performing skin tests, and/or
- 10 clock hours of training in venipuncture and skin puncture for the purpose of withdrawing blood, and
- Satisfactory performance by the trainee of at least 10 each of intramuscular, subcutaneous, and intradermal injections and 10 skin tests, and/or at least 10 venipuncture and 10 skin punctures.
- For those only administering medicine by inhalation, 10 clock hours of training in administering medical by inhalation.
- Training in (a) through (d) above, shall include instruction and demonstration in:
    - pertinent anatomy and physiology appropriate to the procedures;
    - choice of equipment;
    - proper technique including sterile technique;
    - hazards and complications;
    - patient care following treatment or tests;
    - emergency procedures; and
    - California law and regulations for medical assistants

In every instance, prior to administration of medicine by a medical assistant, a licensed physician or podiatrist, or another appropriate licensed person shall verify the correct medication and dosage. The supervising physician or podiatrist must authorize any technical supportive services performed by the medical assistant and that supervising physician or podiatrist must be physically present in the treatment facility when procedures are performed, except as provided in section 2069(a) of the code.

Are medical assistants required to be licensed or certified by the State of California to perform procedures within their "scope of practice"?

No. Medical assistants are not licensed, certified, or registered by the State of California. However, the medical assistant's employer and/or supervising physician's or podiatrist's malpractice insurance carrier may require that the medical assistant be certified by a national or private association. A medical assistant must be certified by one of the approved certifying organizations in order to train other medical assistants. (Title 16 CCR 1366.3)

How may medical assistants legally "administer medications"?

The phrase intends to mean the direct application of medication in several ways including simple injections, ingestion and inhalation or pre-measured medications. For our purposes, the phrase "administer medications" when used regarding medical assistants, means to inject, handle, or provide medications to a patient after verification by a physician, podiatrist or another appropriate licensed person.

Are medical assistants allowed to administer injections of scheduled drugs?

If after receiving the appropriate training as indicated in Item 1, medical assistants are allowed to administer injections of scheduled drugs only if the dosage is verified and the injection is intramuscular, intradermal or subcutaneous. The supervising physician or podiatrist must be on the premises as required in section 2069 of the Business and Professions Code, except as provided in subdivision (a) of that section. However, this does not include the administration of any anesthetic agent.

Are medical assistants allowed to start or disconnect IV's or administer injections or medication into IV's?

No. Medical assistants may not place the needle or start and disconnect the infusion tube of an IV. These procedures are considered invasive, and therefore, not within the medical assistant's scope of practice. Medical assistants are not allowed to administer medications or injections into the IV line. (Title 16 CCR 1366(b)(1))

Are medical assistants allowed to perform nasal smears?

Yes. Only if the procedure is limited to the opening of the nasal cavity.

Are medical assistants permitted to perform "finger sticks"?

Yes. Medical assistants are trained and allowed to draw blood as long as they have received the proper training. The procedure of finger stick is the pricking of the finger in order to collect a sample of blood. This procedure is within the "scope of practice" of a medical assistant.

Are medical assistants allowed to swab the throat in order to preserve the specimen in a throat culture?

Yes. Medical assistants are allowed to swab throats as long as the medical assistant has received the proper training and a physician or podiatrist is on the premises.

Are medical assistants allowed to take a patient's blood pressure?

Yes. Medical assistants are allowed to take the necessary information to prepare a patient for the physician's or podiatrist's visit. This information may include taking the patient's height, weight, temperature, blood pressure and noting the information on the patient's chart.

Are medical assistants allowed to give narcotic injections?

Yes. At this time there are no restrictions as to what type of medications a medical assistant may inject, EXCEPT anesthetic agents, as long as the medication has been pre-verified and the injection is either intradermal, intramuscular, or subcutaneous. (16 CCR 1366 (b)(1)). Both 1366 and Business and Professions Code section 2069 provide that they shall not be construed as authorizing the administration of any anesthetic agent by a medical assistant."

Are medical assistants allowed to have access to the keys of the narcotic medication cabinet?

This question should be directed to the supervising physician or podiatrist as it is an "in-house" procedure and the decision must be made by the supervising physician or podiatrist.

Are medical assistants allowed to chart pupillary responses?

No. The charting of pupillary responses is considered an assessment, which is a form of interpretation. Medical assistants are not allowed to read, interpret or diagnose symptoms or test results.

Are medical assistants allowed to insert urine catheters?

No. Insertion of a urine catheter is considered an invasive procedure and therefore, not within the medical assistant's scope of practice.

Are medical assistants allowed to perform telephone triage?

No. Medical assistants are not allowed to independently perform telephone triage as they are not legally authorized to interpret data or diagnose symptoms.

Are medical assistants allowed to apply orthopedic splints in emergency situations, such as splints in a physician's office?

No. Medical assistants are legally authorized only to remove casts, splints and other external devices. Placement of these devices does not fall within the medical assistant's scope of practice. Please reference CCR Section 1366(b)(3).

Are medical assistants allowed to interpret the results of skin tests?

No. Medical assistants may measure and describe the test reaction and make a record in the patient's chart. For every questionable test result, the result should be immediately brought to the physician's attention. In addition, all results need to be reported to the appropriate provider. Please reference 16 CCR 1366(b)(2).

Can medical assistants be supervised by a nurse practitioner, nurse midwife, or physician’s assistant in the absence of a physician and surgeon?

Per Business and Professions Code section 2069 (a)(1), a supervising physician and surgeon at a "community clinic" licensed under Health and Safety Code section 1204(a) may, at his or her discretion, in consultation with the nurse practitioner, nurse midwife, or physician assistant provide written instructions to be followed by a medical assistant in the performance of tasks or supportive services. The written instructions may provide that the supervisory function for the medical assistant in performing these tasks or supportive services may be delegated to the nurse practitioner, nurse midwife, or physician assistant and that those tasks may be performed when the supervising physician and surgeon is not on site.

Can medical assistants call in refills to a pharmacy?

Yes. Under the direct supervision of the physician or podiatrist, a medical assistant may call in routine refills that are exact and have no changes in the dosage levels. The refill must be documented in the patient's chart as a standing order, patient specific. Medical assistants may not call in new prescriptions or any prescriptions that have changes. The physician should view carefully his or her decision to allow medical assistants to perform this task, as the authority to prescribe or refill prescriptions is only granted to licensed physicians and surgeons, podiatrists, or those individuals authorized by law to do so.

Can medical assistants perform hearing tests?

Yes. Medical assistants may perform hearing tests under the direct supervision of a licensed physician and surgeon or podiatrist. This procedure is within the scope of practice of a medical assistant. Per Business and Professions Code section 2530.5(a), "Nothing in this chapter shall be construed as restricting hearing testing conducted by licensed physicians and surgeons or by persons conducting hearing tests under the direct supervision of a physician and surgeon."

Are medical assistants allowed to administer flu shots?

Yes. After receiving the appropriate training as indicated in the first question, medical assistants are allowed to administer influenza vaccinations in a clinic or physician's office settings. The dosage must be verified and the

supervising practitioner must be on the premises as required in section 2069 of the Business and Professions Code, except as provided in subdivision (a) of that section.

However, if the shot is being provided at a local governmental or private, nonprofit agency the vaccine shall be administered only by a physician, a registered nurse, or a licensed vocational nurse acting within the scope of their professional practice acts. The physician under whose direction the registered nurse or a licensed vocational nurse is acting shall require the nurse to satisfactorily demonstrate familiarity with (1) contraindication for the administration of such immunizing agents, (2) treatment of possible anaphylactic reactions, and (3) the administration of treatment, and reactions to such immunizing agents. (Health & Safety section 104900(e))

- Medical Assistant Certifying Agencies Approved by the Medical Board
- Laws, Regulations, and Current Information
- Business and Professions Code Section 2544 Interpretation
- Additional Information Regarding Medical Assistants

Development of the DM RN Care Manager Role

Amalia Fyles, RN, MSN, CNS, CDE and Elissa Hallen, RN, CDE

COMMUNITY HEALTH NETWORK

SAN FRANCISCO GENERAL HOSPITAL MEDICAL CENTER

NAME

DOB

MRN

PCP

Client ID / Addressograph

Outpatient Interdisciplinary Education Record

DIABETES EDUCATION

Assessment

Barriers to education: ☐ None

☐ Language ☐ Age ☐ Motor or Sensory Impairment (describe): _____

☐ Vision Loss ☐ Religion _____

☐ Hearing Loss ☐ Emotional State ☐ Other (describe): _____

☐ Unable to Read ☐ Denial _____

How does the client prefer to learn:

☐ Hearing ☐ Seeing

☐ Reading ☐ Hands-On

☐ Group Discussion

Outside services required:

☐ Home Health ☐ Hearing

☐ Physical Therapy _____

☐ _____

Teaching documentation

Topic	Date Initiated	Client Verbalized Understanding	Client Demonstrates Skill	Client Not Taught (Reason)	Comments (e.g. family involvement, follow-up, etc.)	Initials of Educator
☐ See ADA recommended topics on back						

Educator Initials: _____ **Signature:** _____ **Date:** _____

Educator Initials: _____ **Signature:** _____ **Date:** _____

Educator Initials: _____ **Signature:** _____ **Date:** _____

Notes:

Teaching documentation – Continued from front

Topic	Date Initiated	Client Verbalized Understanding	Client Demonstrates Skill	Client Not Taught (Reason)	Comments (e.g. family involvement, follow-up, etc.)	Initials of Educator
1. Diabetes Disease Process						
2. Nutritional Mngt ❑ **RD Visit**						
• Diet basics						
• Carbo counting						
3. Physical activity						
4. Medications						
• Oral medications						
• Insulin administration □ Mix dose □ Single dose						
• Intensive insulin management					Correction factor: Carb ratio:	
5. Self-monitoring of blood glucose. Meter type:						
• Urine testing (Ketones for type 1)						
6. Acute complications						
• Hyperglycemia & treatment						
• Hypoglycemia & • treatment						
• ID/ Bracelet/ Card						
7. Chronic complications – Risk reduction (CV, renal, eyes, nerves)						
• Foot care						
• Smoking					❑ Smoking cessation counseling Call: 1-800 NO BUTTS	
8. Goal setting and Problem solving						
• Tai chi class						
• Resource list						
• Group class						
• Sick Day						
• Travel						
9. Stress Mngt / Psychosocial Adjustment						
10. Preconception Ed						

COMMUNITY HEALTH NETWORK OF SAN FRANCISCO

NAME

DOB

MRN

PCP

Patient ID / Addressograph

DIABETES SELF MANAGEMENT EDUCATION RECORD

DIAGNOSIS: DM1 DM2 ↑ Lipids HTN Depression Neuropathy Retinopathy Renal Dz. Other:

☐ New Patient ☐ Follow-up	Date of Dx::	Country of Origin / Primary Language:	Interpreter Needed ☐ Yes ☐ No:

Fasting FSBG: _____

Random FSBG: _____

Wt.: _____ Ht. _____

BMI: _____ Pulse: _____

B/P: _____

Pain: ☐ Yes ☐ No I = intermittent C = constant

Location	Scale (1-10)	Pattern (I/ C)
Comments:		

Self Blood Glucose Monitoring (Ranges)		
Time	Pre Meal	2 Hr Post Meal

HYPERGLYCEMIA ☐ **No Symptoms**

☐ Constant thirst ☐ Frequent urination
☐ Numb/tingling hand/feet ☐ Dry/itchy skin
☐ Blurry vision ☐ Nocturia
☐ Lack of energy ☐ Ketones

HYPOGLYCEMIA ☐ **No Symptoms**

☐ Hunger ☐ Dizziness/shakey
☐ Sweating ☐ Confusion
☐ Palpitations ☐ Headache

Frequency: _____ x per ☐ wk ☐ mo
Time of day: _____

Knows sx: ☐ Yes ☐ No Knows interventions: ☐ Yes ☐ No

MEDICATIONS

☐ DM Oral Meds

_____
_____
_____

☐ Insulin

Type	Units	Time

☐ HTN Meds/ Cardiac Meds

_____
_____
_____
_____
_____
_____

☐ Insulin correction/Bolus:

☐ Cholesterol Meds

☐ Other: _____
_____
_____

☐ Aspirin

LABS

☐ LCR labs unchanged, date:_____

Test	Date	Value	Date	Value
Hgb A_{1c}				
Creatinine				
Cholesterol				
HDL/LDL				
Triglycerides				
Urine Alb/Creat				
ALT				
Other:				

Risk Behaviors

☐ Smoking ☐ Poor med adherence
☐ ETOH ☐ Illicit drugs:
☐ Other (comment):

Nutrition

	Amount	Goal*		Amount	Goal*
Meals per day		3	Starch ☐ meal ☐ day		6 - 11
Conc. Sweets		minimal			
Fruits		2 - 3	Milk		2 - 3
Vegetables		3 - 5	Protein		3
Fat intake		minimal	Label reading: ☐ Yes ☐ No		

* Goal is based on ADA recommended daily allowance

Comment:

Physical Activity

☐ Sedentary ☐ Moderate ☐ Active
Type: Amount:

Barriers to Self Management

☐ Low literacy ☐ Language ☐ Vision ☐ Hearing
Comments:

Psychosocial Barriers

☐ Homeless ☐ Emotional state ☐ Cognitive ☐ Financial
☐ Cultural ☐ Religion ☐ Denial
Comments:

ASSESSMENT/PLAN

Learning preferences: ☐ Hearing ☐ Reading ☐Seeing ☐ Group ☐ Hands-on

☐ See action plan ☐ Smoking cessation counseling– Call 1(800) NO BUTTS

Referrals/Follow-up

	Date		Date
Smoking Cessation		Primary Care MD	
Family Planning		Psycho-Social	
High Risk OB		Social Services	
Nutrition		Other/Follow-up:	
Ophthalmology			
Podiatry			

Date: _____ Time: _____ Signature: _____ Title: _____ CHN ID #: _____
(if applicable)

COMMUNITY HEALTH NETWORK OF SAN FRANCISCO

NAME

DOB

MRN

PCP

Client ID / Addressograph

DIABETES SELF MANAGEMENT - GOAL / ACTION PLAN

Area Being Addressed

☐ Physical Activity ☐ Eating ☐ Medication ☐ Blood Glucose Monitoring

Problem Solving	Risk Reduction	Living with Diabetes
☐ Hyperglycemia ☐ Travel ☐ Hypoglycemia ☐ Sick days	☐ BP ☐ Lipids ☐ Foot ☐ Eye ☐ Dental ☐ Smoking ☐ Drug use ☐ Skin ☐ Weight ☐ Pregnancy	☐ Stress management ☐ Support system ☐ Fun ☐ Depression ☐ Sexuality ☐ Cultural belief(s)

Prior Goal - Progress

One thing you feel good about: _____

One thing you are concerned about: _____

Last action plan: ☐ Achieved goal ☐ Partial achievement ☐ Not achieved

Comment: _____

Goal

☐ New

☐ Existing

.....

Action Plan

What: .....

How much: .....

When: .....

How often: .....

Readiness (1–10)

0-3	4-6	7-10
Not Ready (raise awareness)	4-6 Unsure (build readiness)	7-10 Ready (negotiate plan)

Self Confidence (Can I do it?)

0 - 2	3 - 5	6 - 8	9 - 10
I don't think I can	Not sure I can	I think I can	Sure I can

Barriers

What might get in the way? .....

Time Line

Goal start date: Expected date goal to be met:

Signatures

Client signature: _____

Staff signature: _____ Title: _____ Date: _____ Time: _____

MAKING THE MOST OF SELF-MONITORING OF BLOOD GLUCOSE (SMBG)

Lawrence Fisher, Ph.D., ABPP
Department of Family & Community Medicine
University of California, San Francisco

Collaborators

Jenny Jelosovsky, M.A.
Christopher Parkin, M.A.
William H. Polonsky, Ph.D., CDE
Charles Schickman, M.D.
Robin Wagner, Ph.D.

Key Question

- What is the value of SMBG in non-insulin using patients with type 2 diabetes?
  - SMBG is core component of care in insulin-treated patients
  - Ongoing controversy over value in non-insulin treated diabetes
  - Cost of diabetes care is exploding (major policy and economic concerns)

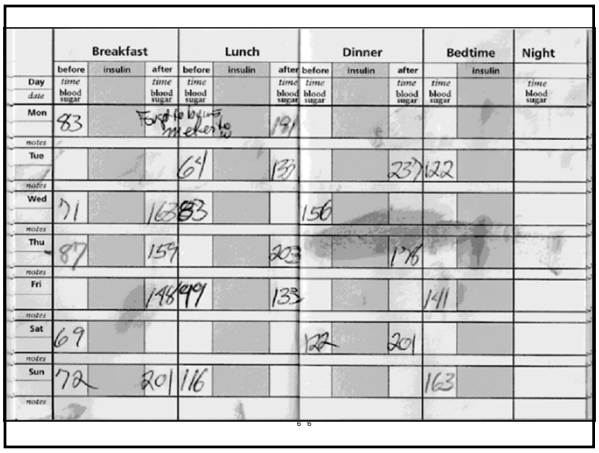
Findings from Observational Studies and RCTs are Mixed …

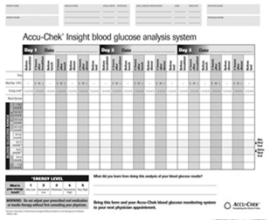
PRO	CON
Observational	**Observational**
ROSSO[1] Kaiser Permanente[3]	Freemantle Diabetes Study[2] QuED[4]
Randomized Controlled Trial	**Randomized Controlled Trial**
German-Austrian[5] DINAMIC 1[6] ASIA[7]	King-Drew Medical Center[8] ESMON[9] DiGEM[10]

1. Martin S et al. Diabetologia, 2006. 2. Davis WA et al. Diabetologia, 2007. 3. Kater A et al. Diabetes Care, 2006. 4. Franciosi M et al. Diabet Med, 2005. 5. Schwedes U et al. Diabetes Care, 2002. . Barnett AH et al. BMJ, 2008. 7. Guerci B et al. Diabetes Metab, 2003. 8. Davidson M et al. Am J Med, 2005. 9. O'Kane MJ et al. BMJ, 2008. 10. Farmer A et al. BMJ, 2007

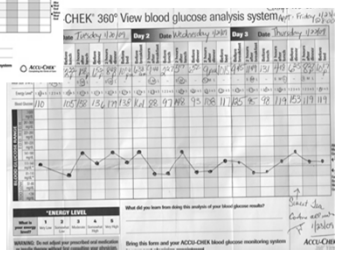
What Needs to Occur for Effective BG Monitoring?

- Patients have to test:
  - Structured
  - Results easily displayed
  - Incentives -- what to look for (patterns) and what to do with what they find (PATIENT TRAINING)
- Patients need to share BG data with their HCP
- HCPs need to review BG data
- HCPs need to know what to look for (patterns) and to make treatment changes based on what they see (HCP TRAINING)
- Process needs to be simple and quick to fit into practice





Simple-to-use tool that allows patients to create 7-point glucose profile over each of 3 consecutive days



Patients record and graph test results along with meal size and energy level

Study Overview

- **Objective:** Assess the effectiveness of blood glucose testing in poorly-controlled (HbA1c ≥7.5%), non-insulin treated T2DM when both patients and HCPs participate in a ***collaborative program*** to gather, interpret and appropriately utilize ***structured*** SMBG data.
- **Main Outcome Measure:**
  Change in HbA1c at 12 months

Study Overview

- **Design:**
  - Two-arm, prospective, cluster-randomized, multi-center, clinical trial
  - 34 primary care practices recruited in the United States
  - 483 patients with non-insulin treated T2DM

Study Overview

- **Interventions:**
  - **Structured Testing Group (STG):**
    - **Quarterly visits, use of the Accu-Chek® 360°View SMBG, point-of-care HbA1c.**
  - **Active Control Group (ACG):**
    - **Usual care enhanced with quarterly HCP visits, point-of-care HbA1c and available SMBG data.**

STG Patient & HCP Protocol

- Training on Tool and program: (Pts = DVD; HCPs = 2 hours).
- Patient prompted by HCP's office to complete Tool within 2 weeks of their next office visit.
- Office visit, Tool reviewed by both patient & HCP, meter upload.

STG Patient & HCP Protocol

- Identify patterns: lows, highs and spikes; link each potential problem area to specific medication and/or lifestyle changes (medication algorithm).
- Repeat use of Tool to evaluate medication changes.
- Process repeated quarterly.
- New BG meter and free strips; point of care A1c.

ACG Patient & HCP Protocol

- Patients received a new BG meter, free strips, instructed on use.
- Patient advised to follow HCP's regular SMBG instructions.
- Patient returns for quarterly DM visits: meter upload at each visit.
- No other SMBG prompting, reminding or training (no 360 Tool).
- No HCP SMBG training or treatment algorithm.

Baseline Demographics: ITT

	Total	ACG	STG	P Value
Age (yrs)	(n=483) 55.8 ±10.7	(n=227) 57.0 ±11.2	(n=256) 54.8 ±10.1	0.0197*
Gender (% male)	257 (53.2)	122 (53.7)	135 (52.7)	0.8243
Ethnicity (% White)	305 (63.1)	152 (67.0)	153 (59.8)	0.1019
HbA1c (%)	8.9 ±1.2	8.9 ±1.2	8.9 ±1.2	0.8751
DM Duration (yrs)	(n=482) 7.6 ±6.1	(n=226) 7.7 ± 6.1	(n=256) 7.5 ±6.1	0.6547
BMI (kg/m2)	(n=475) 35.1 ±7.3	(n=219) 35.1 ±6.7	(n=256) 35.0 ±7.8	0.8851

*statistically significant

Five Sets of Findings

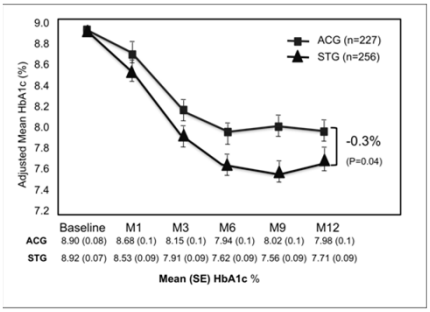
- **Change in HbA1c over time**
- **Change in 7-point BG data**
- **Treatment intensification findings**
- **BG frequency results**
- **Change in depression/distress**

Change in HbA1c Over Time

12-Month Results

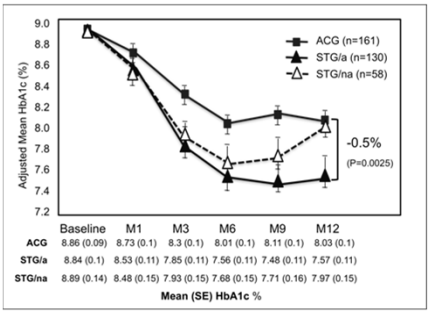
ITT: Adjusted Mean HbA1c Over Time

-1.2 (0.09) STG vs. -0.9 (0.10) ACG



PP: Adjusted Mean HbA1c Over Time

-1.3 (0.11) STG vs. -0.8 (0.11) ACG

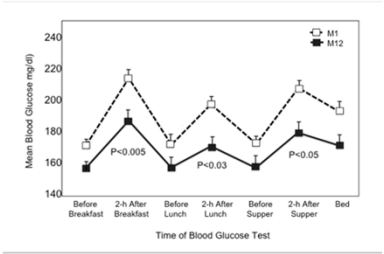


Change in 7-Point BG Profiles and Glucose Variability Over Time

12-Month Results:

(STG group only)

ITT: Change in 7-Pt. BG Profiles Over Time



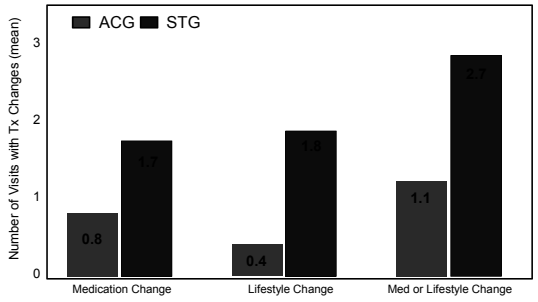
Significantly lower average, pre-prandial, postprandial and bedtime glucose levels (P<0.001)
Significant reductions in degree of postprandial glucose excursions at all meals
Mean (SE) Change in MAGE: M1, 38.5 mg/dl (0.9); M12, 34.3 mg/dl (1.0) (P=0.0003)

Intensification of Treatment

12-Month Results

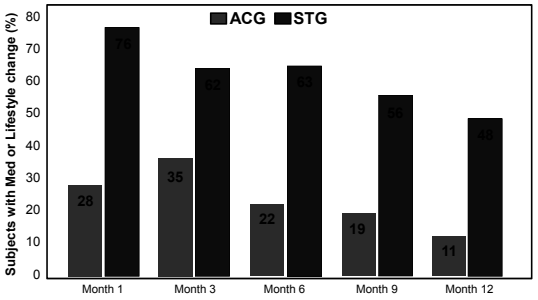
Visits in which a medication and/or lifestyle change occurred

ITT: Number of Scheduled Visits With A Prescribed Change *(out of 5)*



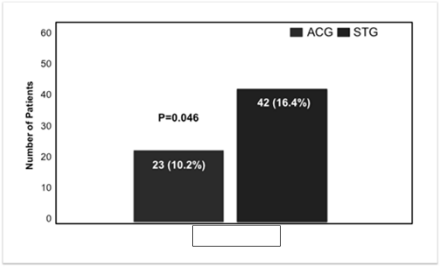
P<0.0001

ITT : Percentage of Subjects Who Received Med/Lifestyle Recommendation *(By Visit)*



P<0.0001

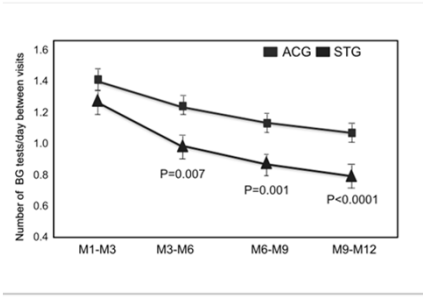
ITT: Number of Patients Started on Intermediate Or Long-Acting Insulin



SMBG Frequency

Over 12 Months

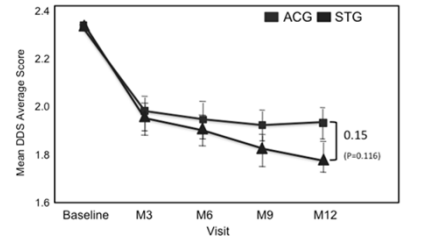
ITT: SMBG Frequency (meter upload)



Change in Diabetes-Related Distress and Depression

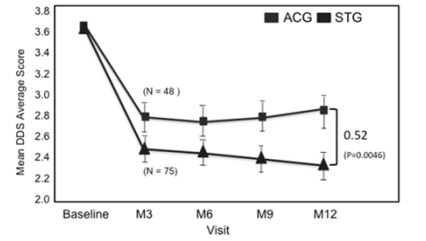
12-Month Results

ITT: Change in Diabetes-Related Distress (DDS)

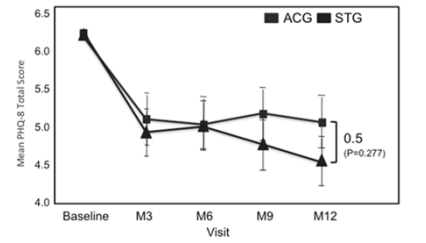


ITT: Change in High DD Sub-Group

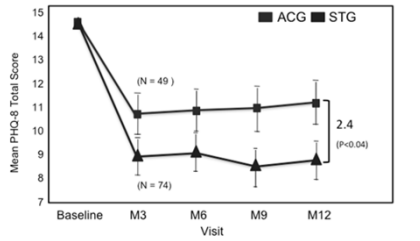
(baseline DDS score ≥3)



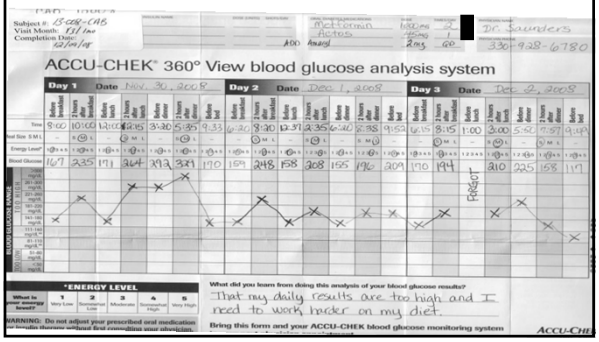
ITT: Change In Depressive Symptoms (PHQ-8)



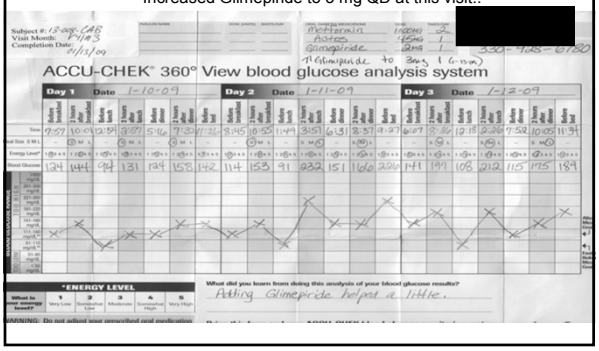
ITT: Change in High Depressive Symptom Sub-Group (PHQ-8 score ≥10)



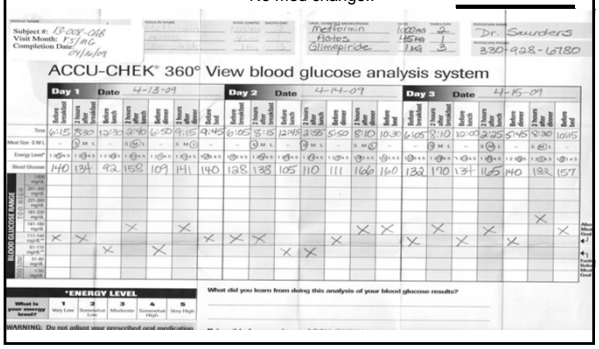
Subject 13-008: 44 year old, female
M1 Visit: BMI: 47.04; Central lab A1c: 8.6%
Current Med: Metformin 1000 mg BID; Actos 45 mg QD
Added Glimepiride 2 mg QD at this visit



Subject 13-008: 44 year old, female, Caucasian
M3 Visit: BMI: 46.64; Central lab A1c: 7.7%
Current Meds: Metformin 1000 mg BID; Actos 45 mg QD; Amaryl 2 mg QD
Increased Glimepiride to 3 mg QD at this visit..



Subject 13-008: 44 year old, female, Caucasian
M6 Visit: BMI: 45.1; Central lab A1c: 7.7%
Current Meds: Metformin 1000 mg BID; Actos 45 mg QD; Amaryl 2 mg QD
No med change..



Summary

1. STG patients showed significantly greater improvement than ACG patients in HbA1c, in both ITT and PP analyses *(conservative estimate compared to usual care)*
2. STG patients showed significant improvement at all time points (7-point profiles) with significant improvements in postprandial excursions and reductions in MAGE
3. STG HCPs initiated treatment significantly earlier and more aggressively than ACG HCPs

Summary

4. There was a significant reduction in testing frequency over time, even with the HbA1c improvement, with greater reduction in STG than ACG - *quality vs. quantity of testing*
5. Both study groups saw a significant reduction in depressive symptoms and diabetes distress
6. There was a significantly larger drop in depression/distress in STG than ACG for those who were markedly depressed/distressed at baseline

FAQ's About Implementation

1. Which patients should complete the form?
2. Is 3 days and 7x per day really necessary?
3. How should patients be trained?
4. Are patient prompts prior to each visit necessary?
5. What is required for clinician training?
6. Can non-physician clinicians be trained?

FAQ's About Implementation

7. Should the form be repeated after a medication change?
8. Will my patients actually complete the form?
9. Does the clinician have to take the time to review the form?
10. How soon after training should patients complete their first form?

Summary

4. There was a significant reduction in testing frequency over time, even with the HbA1c improvement, with greater reduction in STG than ACG - *quality vs. quantity of testing*
5. Both study groups saw a significant reduction in depressive symptoms and diabetes distress
6. There was a significantly larger drop in depression/distress in STG than ACG for those who were markedly depressed/distressed at baseline

Summary

4. There was a significant reduction in testing frequency over time, even with the HbA1c improvement, with greater reduction in STG than ACG - *quality vs. quantity of testing*
5. Both study groups saw a significant reduction in depressive symptoms and diabetes distress
6. There was a significantly larger drop in depression/distress in STG than ACG for those who were markedly depressed/distressed at baseline

Psychological Insulin Resistance Addressing Barriers and Strategies

Amalia Dangilan Fyles RN,CNS,CDE
San Francisco General Hospital

Psychological Insulin Resistance

About a third of patients with type 2 diabetes are unwilling to take insulin. A syndrome called "psychological insulin resistance" (PIR)

Negotiating Change

Listen

Establish Rapport

Develop Trust

Be Open to Cultural differences

Assess Readiness and Confidence

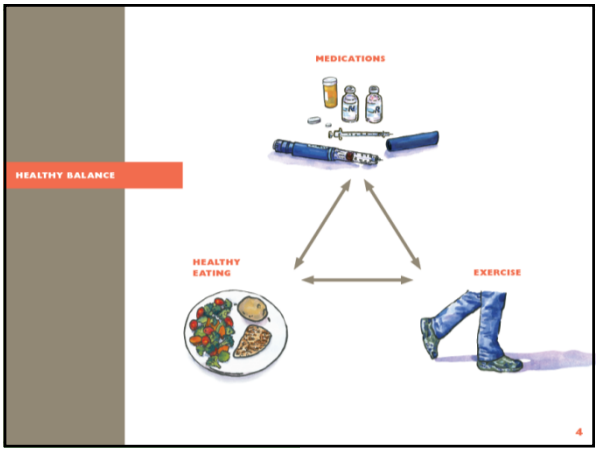
Patient Perceived Barriers

- Self Blame—Starting insulin therapy may make individuals feel that they have failed at managing their diabetes.
- Fear of getting low blood sugars
- Insulin injections would restrict their lifestyle.
- Needle phobia.
- Permanent need for insulin
- Fear their diabetes is now serious.
- Insulin is viewed as a last resort.
- Fear of insulin therapy causing complications (blindess,amputations and kidney failure)

Strategies For Overcoming PIR

- Start the insulin dialogue early= Positive Framing
  - Insulin is a natural hormone everyone needs
    - To live, To use your food, To stay healthy
    - Overtime the pancreas produces less insulin and it is good that it can be replaced.
    - Success stories of celebrities and athletes using insulin
- Demystify self-blame
  - Acknowledge their efforts or difficulties with
    - Diet and Exercise
    - Insulin is a essential component that must be included
- Negotiate a trial period =Preserve Patient sense of Control

Diabetes Type 2 is Progressive



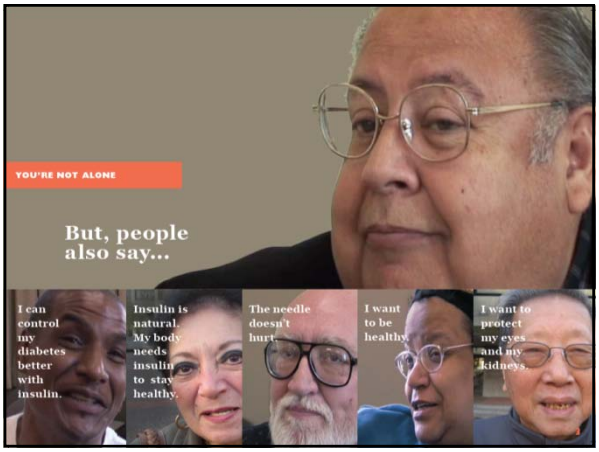
More on Strategies

- **Develop Clear parameters to evaluate progress**
  - Show A1c scale, lower than 7% protects your eyes and kidneys. “Do you want to know where you are?..Where do you want to be?”
  - Goal: 80-180 (prevent complications)
- **Address degree of symptoms and improvement**
  - Less thirst, less hunger,more energy
  - Evaluate episodes of lows and tx

Strategies

- **Begin with a simple regimen**
  - -Prefills, pens, shorter needles (8mm)
  - -Clear labels, simple cues (Identify support, learning barriers)
  - -Bedtime shot of basal insulin (NPH or Glargine)

- **Focus on Well-being and relationship of glycemic control with quality of life**
  - –Able to sleep through the night, less urination
  - –Less irritable, more energy
  - –Praise Accomplishments



Intervention Stategies Summary

- **Identify Personal obstacles**
- **Preserve Patient sense of Control**
- **Enhance Self-Efficacy for IT**
  - Insulin Start Groups
  - Positive Role Models
- **Frame a positive message = Pt has not failed**
- **Educate regarding risk and prevention of hypoglycemia**
- **Address syringe phobia= demo shot, know best devices,tools**
- **Reinforce the benefits of IT**

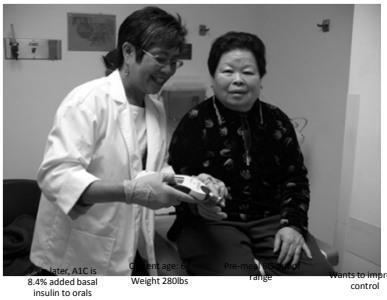
Do Use Insulin as a Threat to Improve Self-Care Behaviors

Hormone Replacement Therapy

…insulin, is it for everyone?

Kim Higgins RN,CDE

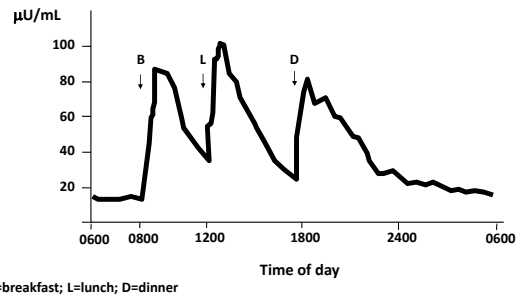
Patient Challenge:
Your patient is on Basal Insulin and Oral Meds but A1C is 9.2%



The Basal-Bolus Insulin Concept

- Basal insulin
  - Controls glucose production between meals and overnight
  - Near-constant levels
  - Usually ~50% of daily needs
- Bolus insulin (mealtime or prandial)
  - Limits hyperglycemia after meals
  - Immediate rise and sharp peak at 1 hour post meal
  - 10% to 20% of total daily insulin requirement at each meal
- For ideal insulin replacement therapy, each component should come from a different insulin

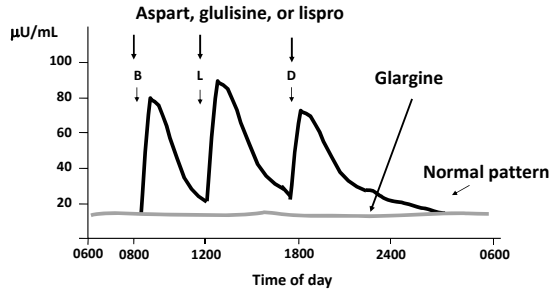
Normal Daily Plasma Insulin Profile
Nondiabetic Obese Individuals



B=breakfast; L=lunch; D=dinner

Polonsky KS et al. *N Engl J Med.* 1988;318:1231-1239

Basal-Bolus Insulin Treatment
Long- and Rapid-Acting Insulin Analogues



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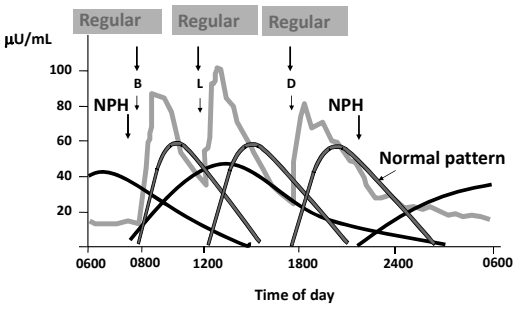
Basal-Bolus Insulin Treatment
NPH + Regular Insulin



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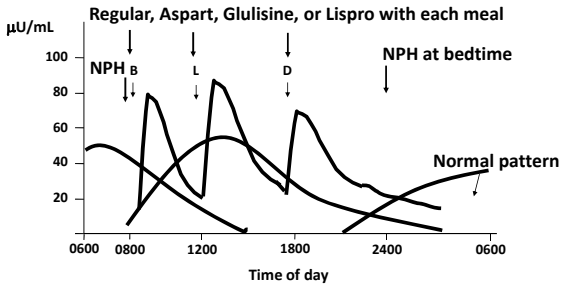

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Therapy considerations

Fasting BG in target range

A1C ≥7%

Recent BGM shows pre-meal BG out of range

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Adding a mealtime insulin to an existing basal insulin is a reasonable strategy for targeting postprandial BG

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- Discuss that DM is a progressive disease
- Stress the importance of mealtime insulin early in the disease
- Address specific barriers to mealtime insulin

Involving your patients in the treatment process may help them understand that mealtime insulin is an important part of therapy.

Typical Daily Insulin Requirements in Adults

- Total daily dosage affected by body size, adiposity, physical activity, and remaining endogenous insulin
- Daily dosage usually 0.3 to 0.8 U/kg in adults*
- Daily dosage usually 50% basal / 50% bolus insulin

Example

Patient	Dosage
50 kg (110 lb) active	12–24 U/day
70 kg (154 lb) somewhat active	30–40 U/day
100 kg (220 lb) obese inactive	80–120 U/day

*Children and adolescents may need 1.0–1.5 U/kg

Leahy JL. In: Leahy JL, Cefalu WT, eds. *Insulin Therapy.* New York, NY: Marcel Dekker Inc; 2002:87-112

Quick Insulin Dosing

Type 1	Type 2
• Weight in lbs ÷4 = TDD • *(total daily insulin dose)* • TDD ÷ 2= Basal/Bolus doses • 140 lbs ÷4 = 35 units/day • 17 units basal insulin • 18 units bolus total doses – 1 unit:15 gms cho – 1 unit: 50 mgm/dl >110	• Weight in lbs ÷2 = TDD • TDD ÷ 2= Basal/Bolus doses • 280 lbs ÷2 = 140 units/day • 70 units basal insulin • 70 units bolus total doses – 1 unit: 3 gms cho – 1 unit: 12 mgm/dl >100

Calculating CHO and ISF

- Carbohydrate Ratio

500 ÷
TDD (140 units) =
3 gms cho :
1 unit insulin

- Insulin Sensitivity Factor
  - *Correction ratio*

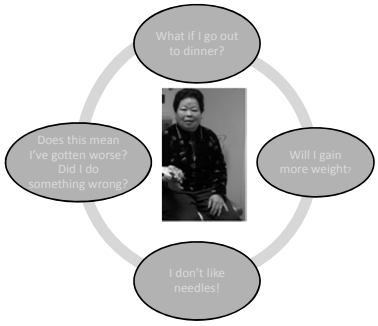
1800 ÷
TDD (140 units) =
12 mgm/dl :
1 unit insulin

Insulin Injection Devices

Insulin pens

- Faster and easier than syringes
  - Improve patient attitude and adherence
  - Have accurate dosing mechanisms

Potential Concerns about Starting Mealtime Insulin



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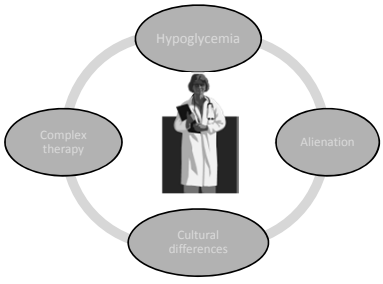


Titrate to Target

start with ≈ 4 units of mealtime insulin

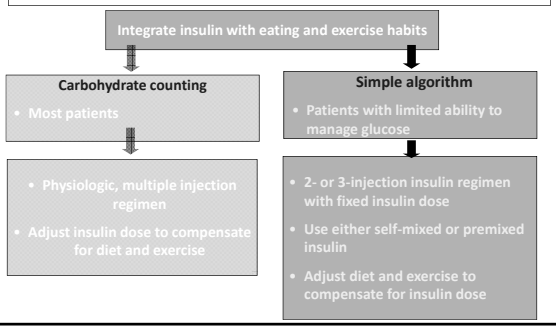
2 units q day or
4 units q 3 days

until post prandial BG within target :
<150-180mg/dl

Two methods: similar outcomes

Carbohydrate Counting vs
Simple algorithm

Bergenstal,r,Johnson,M,Powers,Mgt; Diabetes care31:1305-1310,2008



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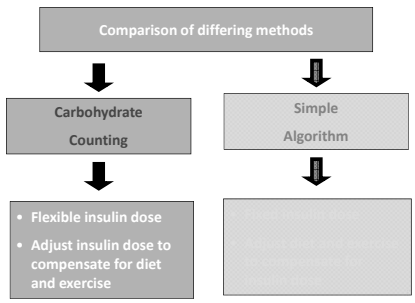

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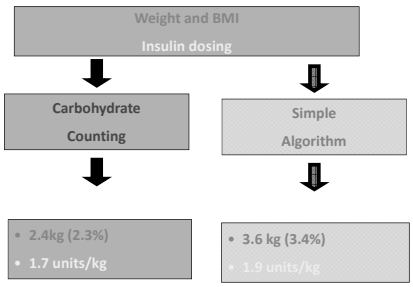

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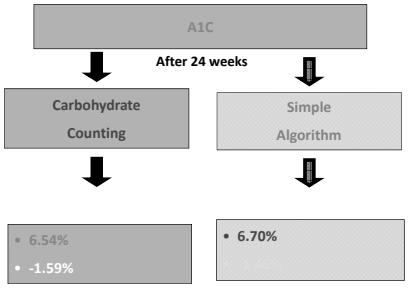

Weight Gain

- Insulin therapy reverses catabolic effects of diabetes
  - Glycosuria reduced
  - Normal fuel-storage mechanisms restored
- Risk of hypoglycemia often causes patients to increase caloric intake and avoid exercise
- Risk of weight gain decreases with more physiologic insulin administration
  - Flexible insulin used dosing to meet dietary and exercise needs

Type 2 Diabetes Lifestyle Considerations

Physical Activity
- Important for weight management and cardiovascular health
- Adjust insulin dosing to compensate for activity level

Family Dynamics
- Tailor nutrition plan to fit within patient's culture
- Caregiver education essential for some elderly patients

Psychological Support
- Decrease risk and impact of associated neurobehavioral problems
  - Depression
  - Anxiety

Barriers to Care
- Provide education and support to overcome
  - Fear of hypoglycemia
  - Patient/caregiver lack of knowledge
  - Reimbursement challenges

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Which Insulin to Use?

- Insurance coverage
  - *NPH used with limited insurance coverage*
- Caution patients re hypoglycemia when using NPH
- Patients with "*limitations*" may benefit form pre-mixed insulin bid or tid

Insulin Dose Changes Pattern Adjustments

- Based on glycemic pattern over several days
- Generally change only one component of insulin at a time

Morning fasting glucose too high/too low	→	**Increase/decrease basal insulin by 10%**
Postprandial glucose (PPG) too high/too low	→	**Adjust carbohydrate-to-insulin ratio**
PPG too low	→	**Decrease bolus insulin**
Correction dose insufficient	→	**Adjust correction factor**

Adjusting Bolus and Correction Doses Sample Correction Dose Calculation

Target	100 mg/dL
Total daily insulin dose	140 U
Correction factor mg/dL "Rule of 1800"	1 U lowers BG by **12** (1800 ÷ 140 = **12**)
Premeal glucose	280 mg/dL

280 – 100 = 180 ÷ 12 = 15 U
in addition to usual mealtime insulin dose

BG=blood glucose

Adjusting Bolus and Correction Doses Correction Doses

- Individually determined
- Based on prevailing blood glucose
- Questions to ask:
  - What is my blood glucose now?
  - What is my target glucose (eg, 100 mg/dL)?
  - How much insulin do I need to reach my target glucose?

Example

Blood Glucose	Rapid Insulin
<50 mg/dL	Decrease 2 units, or consume 10–15 g oral carbohydrate
50–69 mg/dL	Decrease 3 units
70–100 mg/dL	Usual dose
100–150 mg/dL	Increase 4 units
151–200 mg/dL	Increase 8 units

Adjusting Bolus and Correction Doses Sample Correction Dose Calculation

Target	100 mg/dL
Total daily insulin dose	140 U
Correction factor "Rule of 1800"	1 U lowers BG by12mg/dl (1800 ÷ 140 = 12)
Premeal glucose	280 mg/dL

280 – 100 = 180 ÷ 12 = 15 U
in addition to usual mealtime insulin dose

BG=blood glucose

Adjusting Bolus and Correction Doses Carbohydrate-to-Insulin Ratio

Based on three questions before meals

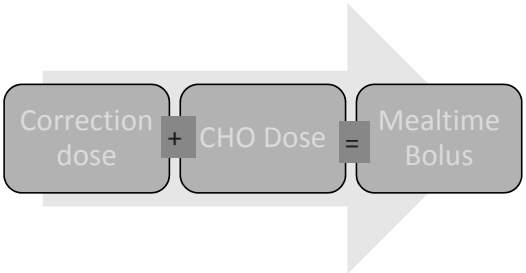
1. How much carbohydrate am I going to eat?
2. What is my insulin dose for this amount of carbohydrate?
3. Should I lower the dose because I plan to be very active or have recently been active?

How does that work? Carbohydrate Ratio (1 unit:3 gms cho) Rapid/Fast Acting Insulin

- Dinner **(60 gms cho)**
  - Lemon Chicken
  - 1 cup rice pilaf (45 gms cho)
  - Asparagus
  - Dinner Roll (15 gms cho)

1 serving	15 gms cho	5 units
2 servings	30 gms cho	10 units
3 servings	45 gms cho	15 units
4 servings	60 gms cho	20 units

Total Pre-Meal Bolus Dose *mealtime bolus*



How to think like a β-cell

- Always have a background insulin available (basal).
- Anticipate food and provide insulin ahead of time (bolus).
  - Even if the glucose level is "normal"
- Downside:
  - Cannot take insulin back once it is given

Practice meal-time bolus

- **CHO**
- **1 unit: 3 gms cho**

Determine how many carbohydrates (cho) you will eat:

- a_____ gms cho
- b_____ gms cho
- c_____ gms cho
- d_____ gms cho

Total gms cho ___ ÷ 3 = ____units

- **Correction Bolus:**
- **1 unit: 12 mg/dl > 100 mg/dl**
- What is your BG?
- What is your target BG? 100 mg/dl

200mg/dl
- 100 mg/dl
100 ÷12= __ units

Cho + Correction=Bolus

- **20 units**
- For 60 gms cho

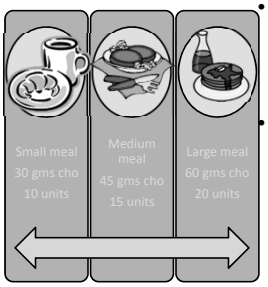
+

- **8 units**
- correction for 100 mg/dl over target

=

- **28 units**
- meal-time bolus

Plate Method



- If carb intake is fairly consistent, insulin doses can be given by "size of meal"
- Consider 45 gms cho : 1 cup starchy food

Correction Bolus

1 unit: 12 mg/dl>100

Rapid/Fast Acting Insulin

70-100 mg/dl	0 units
101-150 mg/dl	4 unit
151-200 mg/dl	8 units
201-250 mg/dl	12 units
251-300 mg/dl	16 units
301-350 mg/dl	20 units

Strategies for Pattern Management

- Several days of record keeping
  - Blood Glucose Monitoring pre and post meals
  - Medication time and dose
  - Activity
  - Meal Records including carbohydrate amounts.

Evaluate Blood Glucose Patterns

- Adjust insulin based on 2-3 day patterns
- Determine which insulin is responsible for Blood Glucose (BG) Pattern
- Adjust insulin 10-20%
- 2-hour post-meal BG needed for rapid insulin titration
- 1 injection of NPH or Levemir may not be enough with rapid insulin use

Goals for Pattern Management

- BG levels within Target Range
- Analyze records 1-2 x/week
- Type 1 : 75-85% within target
- Type 2 : 90-100% within target

Case Study …Lydia, 1 month later

- NPH 16 units qam x 3 mos
- NPH 14 units qpm x 3 mos
- No overnight hypoglycemia
- Recently started on Regular insulin at breakfast and dinner

What changes will you make?

Adjustment by patterns

Fix the Fasting First

Lower the supper NPH

Month	Night-Time	Break-fast	Insulin			Notes	Lunch	Insul.	Notes	Supper	Insulin			Notes	Evening Snack	Insulin			Comments
Date	BG	BG	K	R	NUUL		BG	K	R		BG	K	R	NUUL		BG	K	R	NUUL	
May 4		162		8	NPH 16		112				84		6	NPH 14		96				
5	3am 60	181		8	NPH 16		108				118			NPH 14		83				
6	3am 56	176		8	NPH 16		99				86									

Adjustment by patterns

Change Both Basal and Bolus?

Month	Night-Time	Break-fast	Insulin			Notes	Lunch	Insul.	Notes	Supper	Insulin			Notes	Evening Snack	Insulin			Comments
Date	BG	BG	K	R	NUUL		BG	K	R		BG	K	R	NUUL		BG	K	R	NUUL	
May 1		257		8	NPH 16		119				105		6	NPH 14		86				
2		168		8	NPH 16		112				84		6	NPH 14		76				
3		189		8	NPH 16		79				114		6	NPH 14		82				

Adjustment by patterns:

reduce dinner Regular or…

Month	Night-Time	Break-fast	Insulin			Notes	Lunch	Insul.	Notes	Supper	Insulin			Notes	Evening Snack	Insulin			Comments
Date	BG	BG	K	R	NUUL		BG	K	R		BG	K	R	NUUL		BG	K	R	NUUL	
May 1		136		3	NPH 20		114				78		5	NPH 10		117				
2		141		3	NPH 20		89				103		5	NPH 10		107				
3	3am 82	149		3	NPH 20		102				106		5	NPH 10		93				

Adjustment by patterns

- Shift NPH to bedtime

Month	Night-Time	Break-fast	Insulin			Notes	Lunch	Insul.	Notes	Supper	Insulin			Notes	Evening Snack	Insulin			Comments
Date	BG	BG	K	R	NU/UL		BG	K	R		BG	K	R	NU/UL		BG	K	R	NU/UL	
May 1		136		3	NPH 20		114				78		5	NPH 10		117				
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3	3am 82	149		3	NPH 20		102				106		5	NPH 10		93				

Adjustment by patterns

Fix the Fasting: Move NPH to HS

Reduce mealtime Regular

Month	Night-Time	Break-fast	Insulin			Notes	Lunch	Insul.	Notes	Supper	Insulin			Notes	Evening Snack	Insulin			Comments
Date	BG	BG	K	R	NU/UL		BG	K	R		BG	K	R	NU/UL		BG	K	R	NU/UL	
May 1		257		8	NPH 16		119				105		6	NPH 14		86				
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Adjustment by patterns

Lower supper NPH

Lower am NPH

What about mealtimes?

Month	Night-Time	Break-fast	Insulin			Notes	Lunch	Insul.	Notes	Supper	Insulin			Notes	Evening Snack	Insulin			Comments
Date	BG	BG	K	R	NU/UL		BG	K	R		BG	K	R	NU/UL		BG	K	R	NU/UL	
May 4		162		8	NPH 16		112				84		6	NPH 14		96				
5	3am 60	181		8	NPH 16		108				118			NPH 14		83				
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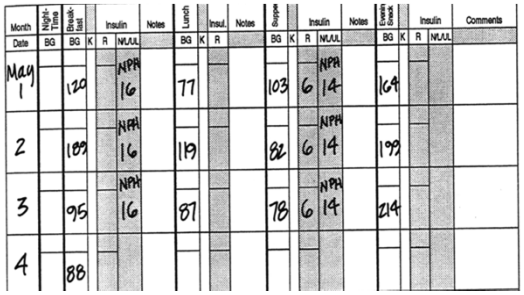
Adjustment by patterns:

Reduce both NPH doses first

Then, maybe need to increase Regular



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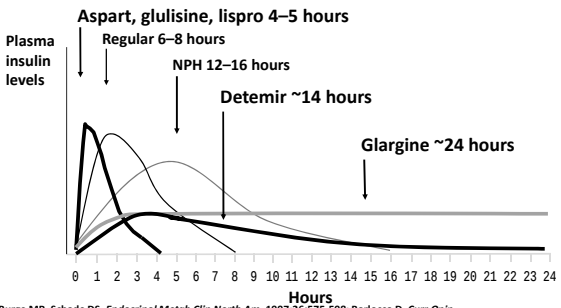
Date	BG	BG	K	R	NPH/L		BG	K	R		BG	K	R	NPH/L		BG	K	R	NPH/L	
May 1		120			NPH 16		77				103	6		NPH 14		164				
2		109			NPH 16		119				82	6		NPH 14		193				
3		95			NPH 16		87				78	6		NPH 14		214				
4		88																		

The Basal-Bolus Insulin Concept

- Basal insulin
  - Controls glucose production between meals and overnight
  - Near-constant levels
  - Usually ~50% of daily needs
- Bolus insulin (mealtime or prandial)
  - Limits hyperglycemia after meals
  - Immediate rise and sharp peak at 1 hour post meal
  - 10% to 20% of total daily insulin requirement at each meal
- For ideal insulin replacement therapy, each component should come from a different insulin

Action Profiles of Insulins



Burge MR, Schade DS. *Endocrinol Metab Clin North Am*. 1997;26:575-598; Barlocco D. *Curr Opin Invest Drugs*. 2003;4:1240-1244; Danne T et al. *Diabetes Care*. 2003;26:3087-3092

Insulin Preparations

Insulin Action	Agents
~~Short acting~~	~~Regular~~
Intermediate acting	Neutral Protamine Hagedorn
NPH	
Rapid acting	Novalog,Humalog,Apidra
	aspart,lispro,gluisine
Long acting	Lantus, Levemir
	glargine,detemir
~~Premixed insulin~~	~~Human 70/30, 50/50~~
	Humalog mix 75/25
	Novolog mix 70/30

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- Insulin pens
- Faster and easier than syringes
  - Improve patient a
  - Have accurate dos

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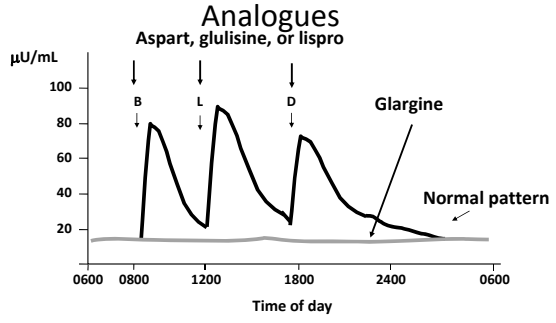

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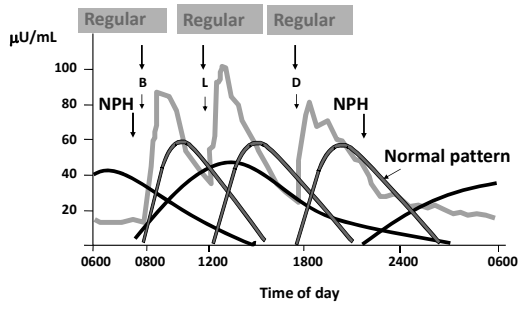

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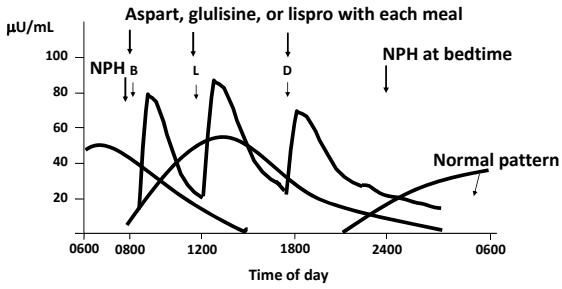

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A1C ≥7%

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Quick Insulin Dosing

Type 1

- Weight in lbs ÷4 = TDD
- (total daily insulin dose)
- TDD ÷ 2= Basal/Bolus doses

- 140 lbs ÷4 = 35 units/day
- 17 units basal insulin
- 18 units bolus total doses
  - 1 unit:15 gms cho
  - 1 unit: 50 mgm/dl >110

Type 2

- Weight in lbs ÷2 = TDD

- TDD ÷ 2= Basal/Bolus doses

- 280 lbs ÷2 = 140 units/day
- 70 units basal insulin
- 70 units bolus total doses
  - 1 unit: 3 gms cho
  - 1 unit: 12 mgm/dl >100

Calculating CHO and ISF

- Carbohydrate Ratio

- 500 ÷
- TDD (140 units) =
- 3 gms cho :
- 1 unit insulin

- Insulin Sensitivity Factor
- Correction ratio

- 1800 ÷
- TDD (140 units) =
- 12 mgm/dl :
- 1unit insulin

When to Add mealtime Insulin: Clinical Indicators

- Initiate mealtime insulin therapy for:
- Not to goal
- Mealtime control

When to Add mealtime Insulin: Patient Indicators

- Patient Readiness factors:
- Recognize BG too high
- Demonstrates willingness
- Generally adherent to basal
- Receptive to initiating

Having a Successful Conversation: Introducing the need for Mealtime insulin

- Discuss that DM is a progressive disease
- Stress the importance of mealtime insulin early in the disease
- Address specific barriers to mealtime

Involving your patients in the treatment process may help them understand that mealtime insulin is an important part of therapy.

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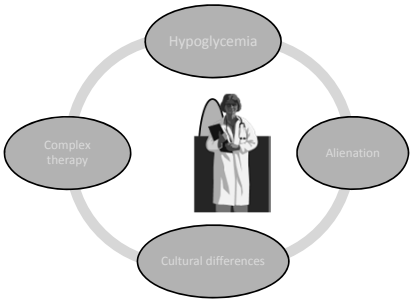

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2 units qday or
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•

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Two methods: similar outcomes
Carbohydrate Counting vs Simple algorithm

Bergenstal,r,Johnson,M,Powers,Mgt; Diabetes care31:1305-1310,2008

Integrate insulin with eating and exercise habits

Carbohydrate counting
- Most patients
- Physiologic, multiple injection regimen
- Adjust insulin dose to compensate for diet and exercise

Simple algorithm
- Patients with limited ability to manage glucose
- 2- or 3-injection insulin regimen with fixed insulin dose
- Use either self-mixed or premixed insulin
- Adjust diet and exercise to compensate for insulin dose

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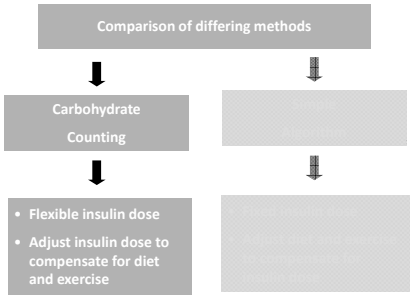

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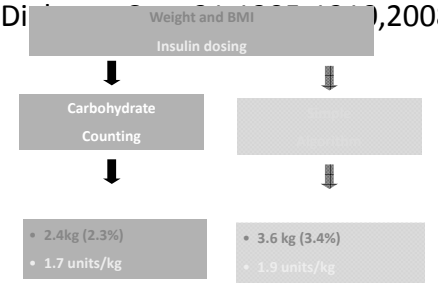
Bergenstal,R; Johnson,M,Powers,Mgt; Di ,2008



Two methods: similar outcomes

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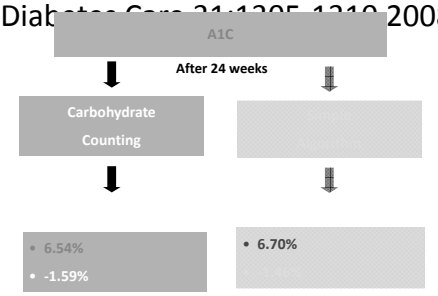

Weight Gain

- Insulin therapy reverses catabolic effects of diabetes
  - Glycosuria reduced
  - Normal fuel-storage mechanisms restored
- Risk of hypoglycemia often causes patients to increase caloric intake and avoid exercise
- Risk of weight gain decreases with more physiologic insulin administration
  - Flexible insulin used dosing to meet dietary and exercise needs

Type 2 Diabetes Lifestyle Considerations

- Physical Activity
- Important for weight ma
  cardiovascular health
- Adjust insulin dosing to c
  activity level

Family Dynamics
- Tailor nutrition plan to fit within patient's culture
- Caregiver education essential for some elderly patients

Psychological Support
- Decrease risk and impact of associated neurobehavioral problems
  - Depression
  - Anxiety

Barriers to Care
- Provide education and support to overcome
  - Fear of hypoglycemia
  - Patient/caregiver lack of knowledge
  - Reimbursement challenges

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Adjusting Bolus and Correction Doses Carbohydrate-to-Insulin Ratio

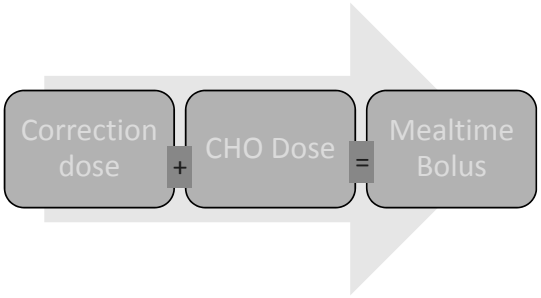
- Based on three questions before meals
  - How much carbohydrate am I going to eat?
  - What is my insulin dose for this amount of carbohydrate?
  - Should I lower the dose because I plan to be very active or have recently been active?

How does that work?
Carbohydrate Ratio (1 unit:3 gms cho)
Rapid/Fast Acting Insulin

- Dinner (60 gms cho)
  - Lemon Chicken
  - 1 cup rice pilaf
  - (45 gms cho)
  - Asparagus
  - Dinner Roll
  - (15 gms cho)

1 serving	15 gms cho	5 units
2 servings	30 gms cho	10 units
3 servings	45 gms cho	15 units
4 servings	60 gms cho	20 units

Total Pre-Meal Bolus Dose
mealtime bolus



In summary…

Follow closely until stable ,
then every 2-4 months as needed.
To be certain**, Lydia's Diabetes will change**.

How to think like a β-cell

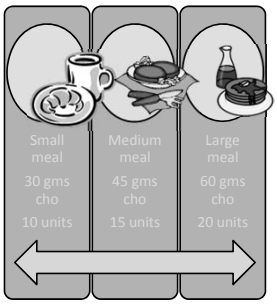
- Always have a background insulin available (basal).
- Anticipate food and provide insulin ahead of time (bolus).
  - Even if the glucose level is "normal"
- Downside:
  - Cannot take insulin back once it is given

Practice meal-time bolus

- CHO
- 1 unit: 3 gms cho
- Determine how many carbohydrates (cho) you will eat:
- a_____ gms cho
- b_____ gms cho
- c_____ gms cho
- d_____ gms cho
- Total gms cho ___ ÷ 3 = ____units

- Correction Bolus:
- 1 unit: 12 mg/dl > 100 mg/dl
- What is your BG?
- What is your target BG? 100 mg/dl
- 200mg/dl
- - 100 mg/dl
- 100 ÷12= __ units

Plate Method



- If carb intake is fairly consistent, insulin doses can be given by "size of meal"
- Consider 45 gms cho : 1 cup starchy food

Correction Bolus
1 unit: 12 mg/dl>100
Rapid/Fast Acting Insulin

70-100 mg/dl	0 units
101-150 mg/dl	4 unit
151-200 mg/dl	8 units
201-250 mg/dl	12 units
251-300 mg/dl	16 units
301-350 mg/dl	20 units

Meal-time Bolus

- 60 gms cho = 20 units
- BG 165 mg/dl = 8 units

- Total bolus= 28 units Rapid/fast acting insulin

What Questions will Lydia have?

What Resources do you have for her?

Intensive Insulin Management

Meal-time bolus worksheet

1) Determine how many carbohydrates (cho) you will eat:

a_____ gms cho

b_____ gms cho

c_____ gms cho

d _____ gms cho

e_____ gms cho

Total _____ gms cho ÷ 15=_____units insulin

(Carbohydrate Bolus)

Correction Bolus:

1 unit: 50 mg/dl > 110 mg/dl

2) What is your Blood Glucose? [ ]

3) What is your target Blood Glucose? - 110 mg/dl

_____

[ ] ÷ 50 =

_____units

Correction Bolus

4) Total Meal Bolus:

[ ] + [ ] = [ ]

Cho Bolus **Correction Bolus** **Total Meal Bolus**

An Update on Insulin: Turning Concepts into a Framework for Providers

Suneil K. Koliwad, MD, PhD
Assistant Professor of Medicine
Diabetes Center, UCSF/SFGH

Making it Work 2011

GLADSTONE INSTITUTE OF CARDIOVASCULAR DISEASE

Goals of Insulin Algorithm

1. Achieve HgbA1C goal.
2. Avoid hypoglycemia.

3. Blend empiric management and self-monitored blood glucose (SMBG) to optimize progress *AND* cater to patient needs, preferences, education, insight.

   Empiric: Regular insulin before largest meal. Dose based on HgbA1C

   SMBG: Insulin is added preceding the meal prior to the highest BGs. Based on home BG for 1-2 weeks (Ideally pre-meals and at bedtime.)

4. Provide guidelines for primary care outpatient providers

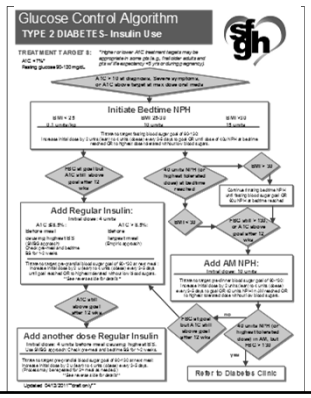
5. These guidelines should not replace or interfere with clinical judgment for a particular patient.

6. List some alternative methods for initiating and titrating insulin

Parts of The Algorithm

- **The Flow Chart**
- **The Medication-Specific Education Guide**
- **Other handy tools**

An Insulin Use Algorithm for All of Us?



General Principles

Mimic physiologic insulin to achieve target blood sugars (without hypoglycemia) and decrease long-term microvascular complications.

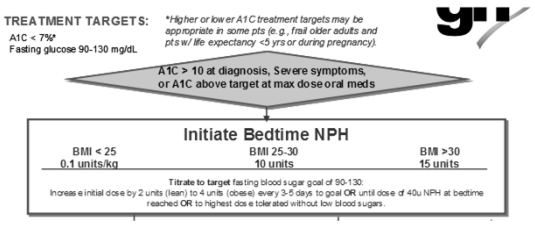
Many insulin regimens are available. Regimens should be individualized to the patient's meal patterns, willingness to be involved, and glycemic control needs.

Any insulin regimen that is acceptable to the patient and achieves blood sugar goals without side effects is appropriate.

When adjusting insulin based on SMBG, consider consistency of patterns, carbohydrate content and regularity of meals, exercise patterns, illness, or severe stressors.

There is intra- and interpersonal variability in the absorption and duration of action of insulin.

A Support to Starting Insulin



General Guidelines for Establishing *Starting* Doses

Establish total daily dose

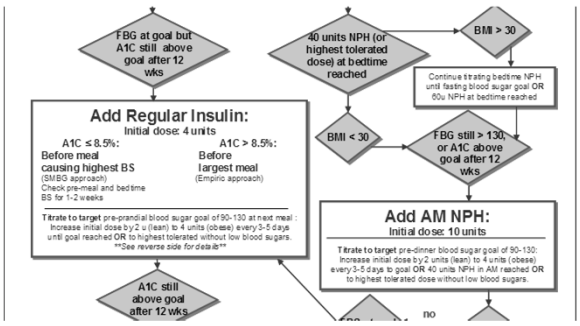
(for thin type 1) weight in lbs ÷ 4
OR weight in kg X 0.2-0.6 for type 1

(for overweight type 2) weight in lbs ÷ 2
OR weight in kg X 0.5-1 for type

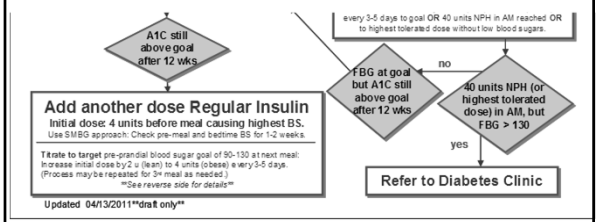
Half the total daily dose = basal insulin needs

Note: Long-acting insulins may be used in combination with metformin, sulfonyureas, pioglitazone and alpha glucosidase inhibitors.

A Support to Advancing Insulin



A Support to Advancing Insulin



Guidelines for Prandial Insulin

Half the total daily dose ÷ 3 = prandial insulin needs OR divide in proportion to relative size of meals

Adjust basal and mealtime insulin further according to results of self-monitored blood glucoses and A1C.

Later, may use insulin-to-carb ratios for those who understand carbohydrate counting and desire more flexibility.

Med-Specific Parts to the Algorithm

CHN Formulary

Storage and Administration
Use with Caution

Pregnancy
Laboratory Monitoring
Side Effects

Other Metabolic Effects

Drug Interactions

Example: Regular Insulin

Mechanism of Action

CHN Formulary

Dosing Instructions

Troubleshooting

If regular insulin is given…		*Then look for target effect…*	*Ensure hypoglycemia is not occurring…*	
Before breakfast	→	Before lunch	Before lunch	Titrate mealtime dose by 2 units (or 10-20% of dose) every 3 days to target BG without hypoglycemia at time of peak action
Before lunch	→	Before dinner	Before dinner	
Before dinner	→	Bedtime	Bedtime	

Example: NPH Insulin

If NPH insulin is given…		*Then look for target effect…*	*Ensure hypoglycemia is not occurring…*	Titrate dose by 2 units (or 10-20% of dose) every 3 days to target BG without hypoglycemia at time of peak action
Before breakfast	→	Before dinner	6-10 hrs after breakfast	
Before dinner	→	Next day FBG	Overnight	
At bedtime	→	Next day FBG	6-10 hrs after bedtime	

Other Handy Tools

Rx FOR SUPPLIES:

Insulin vials:

- Each vial contains 10ml = 1000 units.
- Store in refrigerator prior to opening.
- Appearance: NPH and NPH-containing premixes = cloudy. Regular, glargine, aspart, lispro = clear
- In-use bottles can be used for one month an do not need to be refrigerated. Do not freez insulin and do not expose to temperatures above 86°F. Avoid exposure to direct heat or light

Insulin syringes (→50u, use 1/2mL syringe, →100u, use 1mL syringe. Request 8mm (5/16") needle.)
Sharps container (Once full may be brought to any SF Walgreens for disposal and replacement.)
Lancets (1 box), **test strips** (specify meter type in rx), **glucose tablets**.
Insulin Pens: Typically require prior authorization. See "Tips" sheet.

TITRATION TIPS: If any hypoglycemic episodes, consider decreasing precipitating insulin dose by 10%

Insulin	When injected	target effect	Ensure no hypoglycemia
Regular	Pre-breakfast/lunch	Before next meal	Before next meal
Regular	Dinner	Bedtime	bedtime
Aspart	Premeal	2-4 hrs after meal	2-4 hrs after injection
Glargine	bedtime	Next day fasting bs	Overnight, during day, or anytime not related to mealtime
NPH	Before breakfast	Before dinner	6-10 hrs after injection
NPH	Before bedtime	Next day fasting bs	6-10 hours after bedtime
70/30	Before breakfast	Before lunch and dinner	Before lunch/dinner
70/30	Before dinner	At bedtime and next day fasting bs	Overnight and next day fasting bs

Other Handy Tools

SAMPLE INSULIN REGIMENS

	Breakfast	Lunch	Dinner	Bedtime
1	--	--	--	NPH or glargine
2	glargine	--	--	--
3	NPH	--	--	NPH
5	NPH + R, or 70/30	--	NPH + R, or 70/30	--
6	NPH + R	--	R	NPH
7	NPH + (R or aspart)	R or aspart	R or aspart	NPH
8	R or aspart	R or aspart	R or aspart	glargine

Summary

The insulin algorithm is a guide, a tool to help achieve several goals

- **Increase insulin starts**
- **Help with strategies to titrate insulin**
- **Help with adding in short-acting insulin**
- **Help to tailor approaches to patients**
- **A reference guide**

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Thank You

sfgh

Thanks to the SFGH Diabetes Clinic Staff and the entire team involved in creating this algorithm

Appendix

Glucose Control Algorithm

TYPE 2 DIABETES- Oral medications

TREATMENT TARGETS:

A1C < 7%*

Fasting glucose: 90–130 mg/dL

**Higher or lower A1C treatment targets may be appropriate in some pts (e.g., frail older adults and pts w/ life expectancy <5 yrs or during pregnancy).*

A1C > 7? yes

A1C > 9? yes

Severe Symptoms or A1C >10? yes

STEP I: Start METFORMIN:

500 mg (1 pill daily → 1pill twice daily → 2 pills twice daily);
Increasing dose every 2 weeks until goal reached.
See 'Biguanides' for Details/Troubleshooting

Contraindications:
-LFTs>3xULN
-Cr>1.4/1.5
-acute/unstable CHF
See 'Biguanides' for Details

FBG > 130 after 6 wks? Or A1C>7 after 12 wks? yes

Start:
METFORMIN & GLIPIZIDE
Escalate metformin and glipizide in parallel

Start:
METFORMIN & INSULIN
See Insulin Algorithm

STEP II: Add GLIPIZIDE:

5 mg (1 pill daily→ 1 pill twice daily → 2 pills twice daily);
Increasing dose every 2 weeks until goal reached.
See 'Sulfonylureas' for Details/Troubleshooting

Contraindications:
-Severe sulfa allergy
See 'Sulfonylureas' for Details

Alternative
Consider Tolbutamide 250mg w/ meals for pt w/ irregular meal patterns. *See 'Sulfonylureas' for Details/Troubleshooting*

FBG > 130 after 6 wks? Or A1C>7 after 12 wks? yes

STEP III: Add NPH Insulin:

Start 10 units at bedtime

Alternatives

1) Add Pioglitazone 15mg
caution: CHF, osteoporosis
See 'Thiazolidinediones' for Details/Troubleshooting

2) Add Acarbose 25mg
See 'Alpha-glucosidase inhibitors' for Details / Troubleshooting

FBG > 130 after 6 wks? Or A1C>7 after 12 wks?

Updated 4/20/2011

Drug	Dosage	Initial dose and titration	A1C effect	Onset	Duration
glipizide (Glucotrol)	5 mg 10 mg	5 mg daily before meals, ↑ by 2.5-5 mg q1-2 wks to max dose 20 mg twice daily	↓ 1 – 2%	1-3 hrs	10-24 hrs
glyburide (Diabeta)	1.25 mg 2.5 mg 5 mg	2.5–5 mg before meal, ↑ by 2.5-5 mg q1-2 wks to max dose 10 mg twice daily	↓ 1 – 2%	2-4 hrs	16-24 hrs
Glimepiride (Amaryl)	1 mg 2 mg 4 mg	Initial, 1-2 mg before first meal of the day, ↑ by 1-2 mg/day every 1-2 wks to max dose 8 mg daily	↓ 1 – 2%	2-3 hrs	24 hrs
tolbutamide (Orinase)	500 mg	250-1000 mg before meal, ↑ by 250-500 mg/meal to max dose 1000 mg three times daily	↓ 1 – 2%	1 hr	6-12 hrs
pioglitazone (Actos)	15 mg	15 mg daily, ↑ by 15 mg every 2-3 mo to max dose 45 mg daily	↓ 0.6 – 1.5%		
metformin (Glucophage)	500 mg 850 mg 1000 mg	500 mg 1 tab daily, then 1 tab twice daily, then 2 tabs twice daily, ↑ q1-2 wks. Max dose 1000 mg twice daily or 850 mg three times daily	↓ 1.5 - 2%		12-18 hrs
acarbose (Precose)	25 mg 50 mg 100 mg	25 mg three times daily, ↑ by 25-50 mg per meal q4-8 wks as needed to achieve goal blood sugars and to minimize GI side effects. Max dose 50 mg three times daily for patient < 60 kg, or 100 mg three times daily for patient > 60 kg	↓ 0.4 – 0.7%	1 hr	

ADA Recommendations 2011 for DM patients

Diagnosis:

One of following (repeat unless unequivocal hyperglycemia): A1C ≥ 6.5%, fasting glucose≥126mg/dl, 2hr ≥ 200 on 75g OGTT, **OR** random glucose ≥ 200mg/dl with classic symptoms.

Targets:

- **A1C < 7.0%** (test q3 mos if not at goal or if med change. At goal: twice yearly)
- **BP ≤ 129/79 mmHg**
- **LDL < 100 mg/dl**. (Consider LDL goal of <70 if overt CVD. If not at goal @ max tolerated statin therapy, alt goal is 30-40% reduction in LDL from baseline.)

Immunizations/Medications:

- **Influenza vaccine.** Annually for pts ≥6 months of age.
- **Pneumococcal vaccine.** x1 for pts ≥ 2yo. Repeat once for ≥ 65yo if 1st was >5yrs ago and pt was < 65yo.
- **Aspirin.** For any pt w/ overt CVD. Consider for men>50, women>60 w/ 1+ CVD risk factors (FH of CVD, htn, smoking, dyslipidemia, albuminuria).
- **Statin.** If overt CVD or > 40yo w/ 1+ CVD risk factors, regardless of baseline lipid levels. (*contraindicated in pregnancy)*
- **ACEI/ARB.** Treat micro- or macroalbuminuria in non-pregnant pts. Treat htn to target. Monitor serum creatinine and potassium. *(contraindicated in pregnancy)*

Screening (DM2: begin at diagnosis, DM1: w/in 5 yrs of dx):

- **Nephropathy:** Annual serum creatinine, albumin-to-creatinine ratio. Monitor for disease progression and to assess response to therapy.
- **Retinopathy:** Annual dilated and comprehensive eye exam by ophthalmologist or optometrist
- **Polyneuropathy:** For all pts starting at dx: Annual foot exam to identify ulcer/amputation risk: inspect, check pulses, test for loss of protective sensation w/ monofilament.

Education:

- **Daily foot care.**
- **Tobacco**: ADVISE ALL PATIENTS NOT TO SMOKE. 1-800-NO BUTTS.
- **Nutrition:** Monitor carbs. Limit alcohol (<1 drink/day ♀, 2 for♂), sat. fat (<7% tot cal), trans fats. Refer to nutritionist.
- **Physical activity:** 150 min/wk of mod intensity aerobic activity (DM2 pts: resistance training 3x/wk if not contraindicated)
- **Hypoglycemia** (BS <70mg/dl). Treat with 15-20g glucose (or any form CHO that contains glucose). Test 15 min after tx. If cont'd hypoglycemia, then repeat tx. Once SMBG returns to normal, pt should eat meal/snack to prevent recurrence. **(Glucagon emergency kit.** Consider prescription if at risk of severe hypoglycemia. Instruct caregivers on use.)

Sulfonylureas

glipizide (Glucotrol), glyburide (Diabeta), glimepiride (Amaryl), tolbutamide (Orinase)

Mechanism of Action

Sulfonylureas stimulate release of insulin from the pancreas, an effect dependent on functioning beta cells of the pancreatic islets.

Other Metabolic Effects

- **Lipids**: no effect
- **Weight**: average 2 kg weight gain is common

Dosing Instructions

Take 30 minutes before meal(s). Hold if skipping meal due to risk of hypoglycemia.

Use in Diabetes Treatment

Adjunct to diet and physical activity in type 2 diabetes, or in combination with metformin, alpha-glucosidase inhibitor, thiazolidinedione or insulin.

Contraindications

- Hypersensitivity to the drug
- Severe sulfa allergy
- Type 1 diabetes
- Pregnancy category C; not recommended in breastfeeding due to possibility of hypoglycemia in infant

Use with Caution

- Choice and dosing of sulfonylurea should be conservative in elderly, debilitated or malnourished patients due to the risk of hypoglycemia.
- Risk of hypoglycemia is increased in patients with impaired renal or hepatic function. Glipizide, which is metabolized almost completely by the liver into inactive metabolites, is preferred if creatinine > 2.5 mg/dL or age over 70.
- For patients with irregular access to meals, consider tolbutamide for its shorter half-life and rapid metabolism by the liver to inactive metabolites.

CHN Formulary

Drug	Dosage	Initial dose and titration	A1C effect	Onset	Half-life	Duration	PHS cost per 100 tabs (2007)
glipizide (Glucotrol)	5 mg 10 mg	5 mg daily before meals, ↑ by 2.5-5 mg q1-2 wks to max dose 20 mg twice daily	↓ 1 – 2%	1-3 hrs	2-4 hrs	10-24 hrs	5 mg: $1.61 10 mg: $2.44
glyburide (Diabeta)	1.25 mg 2.5 mg 5 mg	2.5–5 mg before meal, ↑ by 2.5-5 mg q1-2 wks to max dose 10 mg twice daily	↓ 1 – 2%	2-4 hrs	10 hrs	16-24 hrs	1.25 mg: $2.18 for 50 tabs 2.5 mg: $2.72 5 mg: $2.42
Glimepiride (Amaryl)	1 mg 2 mg 4 mg	Initial, 1-2 mg before first meal of the day, ↑ by 1-2 mg/day every 1-2 wks to max dose 8 mg daily		2-3 hrs	5-9 hrs	24 hrs	--
tolbutamide (Orinase)	500 mg	250-1000 mg before meal, ↑ by 250-500 mg/meal to max dose 1000 mg three times daily	↓ 1 – 2%	1 hr	4-6 hrs	6-12 hrs	500 mg: $9.88

Possible Side Effects

- Hypoglycemia may occur, especially with excessive doses of sulfonylureas, increased exercise, alcohol consumption or decreased food intake.
- GI disturbance, nausea, epigastric fullness and heartburn occur in 1.8% of patients and tend to be dose-related. Symptoms may resolve if dose is reduced.
- Photosensitivity and allergic skin reactions (pruritis, eczema, urticaria, maculopapular eruptions) can occur with all sulfonylureas.
- A disulfiram-like reaction can occur with all sulfonylureas when taken with moderate-large amounts of alcohol. This reaction may be more likely with tolbutamide than other sulfonylureas, occurring in 5% if alcohol is used concomitantly.

Drug Interactions

- Hypoglycemic action of sulfonylureas may be potentiated by NSAIDS, warfarin, salicylates, sulfonamides, allopurinol, probenecid and MAOIs. Monitor for changes in glycemic control.
- Certain drugs may cause hyperglycemia such as steroids, diuretics, niacin, estrogen, progestins, phenytoin, INH, rifampin, phenothiazine and sympathomimetics. When these drugs are added to a sulfonylurea, monitor for loss of glycemic control. When these drugs are withdrawn from a patient already on a sulfonylurea, monitor for hypoglycemia.
- Hypoglycemic symptoms may be blunted in patients taking beta-adrenergic blockers or other sympatholytic agents.

Thiazolidinediones

pioglitazone (Actos)

Mechanism of Action

Thiazolidinediones decrease insulin resistance in muscle and adipose tissue and inhibit hepatic gluconeogenesis, thus improving insulin sensitivity, reducing circulating insulin levels and improving glycemic control. Thiazolidinediones are not effective in the absence of insulin.

Metabolic Effects

- **Lipids**: overall clinical studies show that pioglitazone lowers triglycerides and raises HDL-C without consistent changes in LDL-C and total cholesterol.
- **Weight**: dose-related average weight gain of 2-4 kg is common

Dosing Instructions

May be taken with or without food. May take 6-12 weeks to achieve maximum effect.

Use in Diabetes Treatment

Adjunct to diet and physical activity in type 2 diabetes, or in combination with metformin, sulfonylurea, alpha-glucosidase inhibitor or insulin.

Contraindications

- Thiazolidinediones are contraindicated in class III and IV congestive heart failure. Increased incidence of class I and II congestive heart failure has been seen when insulin was added to either rosiglitazone (2.4%) or pioglitazone (0.3 – 0.9%).
- Hypersensitivity to thiazolidinediones
- Active hepatic disease or ALT > 2.5 times upper limit of normal
- Pregnancy category C; should not be taken by breastfeeding women

Use with Caution

- Thiazolidinediones can cause fluid retention, thus causing or exacerbating congestive heart failure. Patients experiencing rapid increase in weight or who develop dyspnea, edema or other symptoms of heart failure should immediately report these symptoms to their health care provider. If used in a patient with class I or II heart failure, initiate at lowest dose and monitor closely for signs and symptoms of heart failure.
- Use with caution in patients with anemia. Pioglitazone may cause decreases in hemoglobin and hematocrit. Across all clinical studies, mean hemoglobin values declined by 2% - 4%. These changes primarily occurred within the first 4 to 12 weeks of therapy and remained constant thereafter.
- Use with caution in patients with elevated transaminases (ALT < 2.5 times upper limit of normal). May need more frequent monitoring
- Increased incidence of lower limb and distal upper limb fractures has been noted in women taking pioglitazone and rosiglitazone. This effect was noted after the first year of treatment and persisted for 34 months. The risk of fracture should be considered in the care of female patients taking thiazolidinediones, and attention should be given to assessing and maintaining bone health according to current standards of care.

- Thiazolidinediones may result in ovulation in some premenopausal anovulatory women. These patients may thus be at increased risk for pregnancy and should receive appropriate contraceptive counseling.
- One meta-analysis showed that rosiglitazone was associated with an increased risk of myocardial ischemic events such as angina or MI. Three other studies have not confirmed or excluded this risk. In their entirety, the available data on the risk of myocardial ischemia are inconclusive, but suggest the possibility of increased cardiovascular risk with rosiglitazone. Studies of pioglitazone have not shown evidence that it is associated with an increased risk of heart attack or stroke.

Laboratory

Prior to initiation of therapy, check baseline creatinine and ALT. Repeat periodically per clinical judgment of the health care provider. Check liver function tests for patients with symptoms of hepatic dysfunction (nausea, vomiting, abdominal pain, fatigue, anorexia, dark urine, jaundice).

CHN Formulary

Drug	Dosage	Initial dose and titration	A1C effect	Half-life	PHS cost per 100 tabs (2007)
pioglitazone (Actos)	15 mg	15 mg daily, ↑ by 15 mg every 2-3 mo to max dose 45 mg daily	↓ 0.6 – 1.5%	16-24 hrs	15 mg: $69.00

Possible Side Effects

- (>10%) Edema, upper respiratory infection
- (<10%) headache, fatigue, myalgia, sinusitis, pharyngitis, tooth disorder, anemia
- Macular edema has been reported in patients taking thiazolidinediones but it is unclear whether there is a causal relationship.
- Hypoglycemia does not occur except with concurrent use of a sulfonylurea or insulin

Drug Interactions

- Pioglitazone may reduce the effectiveness of oral contraceptives. Recommend alternative contraception.
- Inhibitors of CYP2C8 (e.g., gemfibrozil, trimethoprim, ritonavir) and inducers of CYP2C8 (e.g., rifampin, carbamazepine, phenytoin, phenobarbital) may affect the action of pioglitazone. Thus further monitoring of glycemic control may be needed if an inhibitor or inducer of CYP2C8 is started or stopped during treatment with pioglitazone.

Biguanides

metformin (Glucophage)

Mechanism of Action

Biguanides decrease hepatic gluconeogenesis, improve insulin sensitivity and decrease intestinal absorption of glucose. By improving insulin action, biguanides also increase glucose uptake particularly in peripheral muscles.

Metabolic Effects

- **Lipids**: metformin decreases triglyceride levels, but does not change HDL-C levels.
- **Weight**: weight stabilization or weight loss of up to 3 – 8 kg. Metformin may attenuate weight gain commonly seen with antipsychotics.

Dosing Instructions

Take after or with meals to minimize gastrointestinal side effects. May take 4+ weeks on maximum therapy to achieve maximum effect.

Use in Diabetes Treatment

First-line treatment in obese patients with type 2 diabetes. Adjunct to diet and physical activity or in combination with a sulfonylurea, alpha-glucosidase inhibitor, thiazolidinedione or insulin.

Other Therapeutic Uses (off-label)

Metformin has been used in polycystic ovarian syndrome to affect the underlying problem of insulin resistance. Metformin has also been reported to increase the rate of spontaneous ovulation, decrease the rate of spontaneous first trimester abortion, and improve the outcome of in-vitro fertilization procedures.

Contraindications

- Clinical situations predisposing the patient to hypoxemia and thus lactic acidosis: cardiovascular collapse, respiratory failure, acute myocardial infarction, acute or unstable congestive heart failure, septicemia
- Hypersensitivity to metformin
- Acute or chronic metabolic acidosis including ketoacidosis
- Renal impairment (serum creatinine ≥ 1.5 in men or ≥ 1.4 in women)
- Hepatic disease, alcoholism
- Pregnancy category B. Limited information on animals and humans show no/minimal risk of adverse events to breastfeeding infants, however use with caution in breastfeeding.

Use with Caution

- Check baseline serum creatinine within 2 weeks prior to radiology studies using iodinated contrast media. May take metformin the day of the procedure per SFGH radiology protocol, but hold metformin for 48 hours following any procedure with contrast. Recheck serum creatinine to ensure in the normal range before restarting metformin.
- Avoid in patients with excessive use of alcohol.

Laboratory

Prior to initiation of therapy, check baseline creatinine and ALT. Monitor serum creatinine yearly, and serum vitamin B12 every 2-3 years (see discussion below regarding vitamin B12).

CHN Formulary

Drug	Dosage	Initial dose and titration	A1C effect	Half-life	Duration	PHS cost per 100 tabs (2007)
metformin (Glucophage)	500 mg 850 mg 1000 mg	500 mg 1 tab daily, then 1 tab twice daily, then 2 tabs twice daily, ↑ q1-2 wks. Max dose 1000 mg twice daily or 850 mg three times daily	↓ 1.5 - 2%	6 hrs	12-18 hrs	500 mg: $1.32 850 mg: $1.80 1000mg: $2.67

Possible Side Effects

- (>10%) dyspepsia, nausea, anorexia, diarrhea, bloating and dysgeusia with a metallic taste are common in the first few weeks of therapy and are often transient.
- (<10%) flushing, palpitations, headache, lightheadedness, rash, myalgia, diaphoresis, upper respiratory infection
- During clinical trials, approximately 7% of patients taking metformin developed asymptomatic subnormal serum vitamin B12 levels which can lead to macrocytic anemia. Screen serum vitamin B12 every 2 years in patients taking metformin or more frequently if macrocytic anemia develops. Vitamin B12 deficiency appears to be reversible with discontinuation of metformin or with vitamin B12 supplementation
- Lactic acidosis is very rare (incidence of 1 per 30,000 patient-years) and typically only occurs in patients who have contraindications to metformin. However, patients should be instructed to report symptoms of malaise, myalgias, worsening somnolence and respiratory distress to their health care provider.
- Hypoglycemia does not occur except with concurrent therapy with a sulfonylurea or insulin.

Drug Interactions

- Certain drugs cause hyperglycemia such as steroids, diuretics, niacin, estrogens, progestins, phenytoin, INH, rifampin, phenothiazine and sympathomimetics. When these are added to metformin, monitor for loss of glycemic control.
- Certain drugs increase plasma levels of metformin: nifedipine, cimetidine, digoxin, morphine, procainamide, quinidine, quinine, ranitidine, triamterene, trimethoprim and vancomycin. Monitor for changes in glycemic control.

Alpha-glucosidase inhibitors

acarbose (Precose)

Mechanism of Action

Alpha-glucosidase inhibitors inhibit pancreatic alpha-amylase and intestinal alpha-glucosidase, thus delaying the digestion of ingested complex carbohydrates, delaying glucose absorption and lowering postprandial hyperglycemia. This class does not enhance insulin secretion. Alpha-glucosidase inhibitors act locally within the gastrointestinal tract; there is low systemic bioavailability.

Other Metabolic Effects

- **Lipids**: unknown
- **Weight**: weight neutral, or may mitigate weight-gain seen with sulfonylureas or insulin

Dosing Instructions

Take with the first bite of each meal.

Use in Diabetes Treatment

Adjunct to diet and physical activity in type 2 diabetes, or in combination with sulfonylurea, biguanide, thiazolidinedione or insulin.

Contraindications

- Type 1 diabetes
- Known hypersensitivity to acarbose
- Patient with cirrhosis, inflammatory bowel disease, colonic ulceration, partial intestinal obstruction, conditions predisposing to intestinal obstruction, or other chronic intestinal diseases that affect digestion or absorption
- Pregnancy category B. The safety of acarbose in pregnant or lactating women has not been established and is not recommended.

Use with Caution

- If elevated transaminases are observed while taking acarbose, consider reduction in dosage or withdrawal of therapy, especially if the elevations persist.
- Long-term clinical trials in patients with serum creatinine > 2.0 mg/dL have not been conducted. Therefore, treatment of these patients with acarbose is not recommended.
- Glucose tablets should be prescribed in advance to patient on acarbose in case of hypoglycemic episodes (see discussion below in Possible Side Effects).

Laboratory

Because doses greater than 50 mg three times daily may cause elevations in serum transaminases, it is recommended to check AST/ALT every 3 months during the first year of treatment, and periodically after.

CHN Formulary

Drug	Dosage	Initial dose and titration	A1C effect	Onset	Half-life	PHS cost per 100 tabs (2007)
acarbose (Precose)	25 mg 50 mg 100 mg	25 mg three times daily, ↑ by 25-50 mg per meal q4-8 wks as needed to achieve goal blood sugars and to minimize GI side effects. Max dose 50 mg three times daily for patient < 60 kg, or 100 mg three times daily for patient > 60 kg	↓ 0.4 – 0.7%	1 hr	2 hrs	25 mg: $35.82 50 mg: $45.03 100 mg: $59.20

Possible Side Effects

- Mild-to-moderate flatulence (70%), diarrhea (30%) and abdominal pain (20%) may develop during the first few weeks of therapy and generally diminish in frequency and intensity over time. These side effects are related to the presence of undigested carbohydrates in the lower gastrointestinal tract.
- (<1%) sleepiness, headache, vertigo, erythema, urticaria, weakness
- An overdose of acarbose will not cause hypoglycemia, however it may be associated with transient gastrointestinal side effects. In cases of overdose, the patient should avoid drinks or food containing carbohydrates for the next 4-6 hrs.
- Hypoglycemia does not occur except with concurrent therapy with a sulfonylurea or insulin. If a patient on acarbose and a sulfonylurea (or insulin) becomes hypoglycemic, treat with oral glucose (dextrose) or milk (glucose and galactose) whose absorption is not inhibited by acarbose. Sucrose is not an appropriate treatment of hypoglycemia in this situation, because acarbose inhibits hydrolysis of sucrose.
- Dose-related elevations in AST/ALT were only observed in clinical trials of patients taking more than the recommended daily dose of acarbose. Those elevations were asymptomatic, reversible, more common in women, and not associated with other evidence of liver dysfunction.

Drug Interactions

- Acarbose may decrease digoxin bioavailability and may require dose adjustment of digoxin
- Certain drugs may cause hyperglycemia such as steroids, diuretics, niacin, estrogen, progestins, phenytoin, INH, rifampin, phenothiazine and sympathomimetics. When these drugs are added to acarbose, monitor for loss of glycemic control.
- Intestinal adsorbents (e.g. charcoal) and digestive enzyme preparations containing carbohydrate-splitting enzymes (e.g., amylase, pancreatin) may reduce the effect of acarbose and should not be taken together.

STANDARDIZED PROCEDURE
DIABETES MELLITUS – Type 2
Diabetes Nursing Visits

Pt info

In order to improve glycemic control for our diabetic patients in a timely manner and to reduce their risk of diabetic complications**, trained** diabetes nurses may use the following protocol for initiation and titration of oral diabetes medications:

MEDICATION NAME:	METFORMIN (Glucophage)
MECHANISM OF ACTION	• Decreases hepatic gluconeogenesis • Improves insulin sensitivity • Increases glucose uptake in peripheral muscles
UPON INITIATION or TITRATION of drug:	**If patient fits the following criteria:** • Recent HbA1C>7% within last 3 months • Creatinine below 1.4 (women) or 1.5 (men within last 3 months • ALT below 3x upper limit of normal within last 3 months • No acute or unstable CHF • No excessive use of alcohol Then patient is good candidate for Metformin. **Consult PCP to initiate Metformin 500mg 1 tablet each day and continue titration to target.**
AT FOLLOW UP VISIT/ PHONE CALL (every 2 weeks) Treatment goals: A1C <7%; 90-130 fasting glucose; (or as determined by provider: _____) **if on metformin monotherapy, fasting glucose target: 70-130*	**GI symptoms**: • Assess for nausea, anorexia, diarrhea, bloating, dysgeusia w/ metallic taste • May be transient or may be improved by taking med after or w/ meals • Stop titration at highest tolerated dose **Signs/symptoms of lactic acidosis:** • Assess for malaise, myalgias, worsening somnolence or respiratory distress • If above signs are present, consult. **Has patient reached treatment targets?** • If yes, then stop titration. Follow up at 3 months and check A1C. • If no, continue titration schedule. If already at suggested max dose, patient needs second agent. Consult DM2 Oral Medication Algorithm. • *Metformin as monotherapy does not cause hypoglycemia. However, if A1C<5% or BS<60, consult.*
TITRATION	If tolerating medication well but patient not at goal, titrate dose up. Increase dose from metformin 500mg 1 tablet daily to 1 tablet TWICE daily. Increase dose from metformin 500mg 1 tablet twice daily to TWO tablets twice daily. SUGGESTED MAX DOSE: 2000mg/day.
ONGOING MONITORING	• Monitor A1C level every 3 months if not at goal. If at goal, monitor A1C every 6 months. Monitor serum creatinine yearly. • Monitor Vitamin B12 levels in 2 years, or sooner if symptoms of B12 deficiency appear (e.g., unexplained anemia, memory loss, neuropathic pain). • If appropriate, consider consult w/ PCP for prescription change (to higher dose or combination pill) to reduce pill burden.
PATIENT EDUCATION	• Avoid excessive alcohol consumption. • Will need to hold med if undergoing radiologic procedure using iodinated contrast media. See Radiology Protocol. • Will not cause hypoglycemia when used as monotherapy

Special Instructions:		
Provider Name:	**Provider Signature:**	**Date:**
RN Name:	**RN Signature:**	**Date:**

STANDARDIZED PROCEDURE
DIABETES MELLITUS – Type 2
Diabetes Nursing Visits

Pt info

In order to improve glycemic control for our diabetic patients in a timely manner and to reduce their risk of diabetic complications, **trained** diabetes nurses may use the following protocol for initiation and titration of oral diabetes medications:

MEDICATION NAME:	GLIPIZIDE (Glucotrol)
MECHANISM OF ACTION	• Stimulates release of insulin from the pancreas. Effect is dependent on functional pancreatic beta cells.
UPON INITIATION or TITRATION of drug:	**If patient fits the following criteria:** • At max tolerated dose of metformin OR has contraindications to metformin. • Recent HbA1C above 7% within last 3 months. Note: If HbA1c >10%, patient needs insulin rather than glipizide. See Insulin Guidelines. • No severe sulfa allergy (history of anaphylaxis or shortness of breath) • Not pregnant or breastfeeding. • CAUTION: elderly, debilitated, or malnourished. *(Glipizide is not contraindicated for these patients, but lower dose at initiation and slower titration schedule may be appropriate to reduce risk for hypoglycemia.) Consult PCP as needed.* • CAUTION: pt with irregular meal patterns. *Consider tolbutamide for its shorter duration of medication effect. Consult PCP as needed.* Then patient is good candidate for Glipizide. **Consult PCP to initiate GLIPIZIDE 5mg 1 tablet daily and continue titration to target.**
AT FOLLOW UP VISIT/ PHONE CALL (every 2 weeks) Treatment goals: 90-130 pre-meal glucose; A1C <7%; (or as determined by provider : _____)	**<u>Signs/symptoms of hypoglycemia:</u>** • Assess for increased activity or exercise, decreased food intake, timing of medication in relation to food intake, or alcohol consumption. • If present, consult. Consider lowering dose. • If A1C<5% or any blood sugar reading <60, consult. **Has patient reached treatment targets?** • If yes, then stop titration. Follow up at 3 months and check A1C. • If no, continue titration schedule. If already at suggested max dose, patient needs insulin initiation. Consult Insulin Guidelines.
TITRATION	If tolerating medication well but patient not at goal, titrate dose up. Increase dose from glipizide 5mg 1 tablet daily to 1 tablet TWICE daily. Increase dose from glipizide 5mg 1 tablet twice daily to TWO tablets twice daily. SUGGESTED MAX DOSE: 20mg/day.
ONGOING MONITORING	• Monitor A1C level every 3 months if not at goal. If at goal, monitor A1C every 6 months. • If appropriate, consider consult w/ PCP for prescription change (to higher dose or combination pill) to reduce pill burden.
PATIENT EDUCATION	• Take 30 minutes before meal(s). • Hold if skipping meal (increased risk of hypoglycemia).

Special instructions:		
Provider Name:	**Provider Signature:**	**Date:**
RN Name:	**RN Signature:**	**Date:**

STANDARDIZED PROCEDURE
DIABETES MELLITUS – Type 2
Diabetes Nursing Visits

Pt info

In order to improve glycemic control for our diabetic patients in a timely manner and to reduce their risk of diabetic complications, **trained** diabetes nurses may use the following protocol for initiation and titration of oral diabetes medications:

MEDICATION NAME:	TOLBUTAMIDE (Orinase)
MECHANISM OF ACTION	• Stimulates release of insulin from the pancreas. Effect is dependent on functional pancreatic beta cells. • Preferred for patients with irregular meal patterns due to shorter duration of medication effect
UPON INITIATION or TITRATION of drug:	**If patient fits the following criteria:** • At max tolerated dose of metformin OR has contraindications to metformin. • Recent HbA1C above 7% within last 3 months. Note: If HbA1c >10% initiate insulin rather than tolbutamide. • No severe sulfa allergy. • Not pregnant or breastfeeding. • CAUTION: elderly, debilitated, or malnourished. *(Tolbutamide is not contraindicated for these patients, but lower dose at initiation and slower titration schedule may be appropriate to reduce risk for hypoglycemia.) Consult PCP as needed.* Then patient is good candidate for Tolbutamide. **Consult PCP to initiate TOLBUTAMIDE 250mg 1 tablet up to three times daily before meals and continue titration to target.**
AT FOLLOW UP VISIT/ PHONE CALL (every 2 weeks) Treatment goals: 90-130 pre-meal glucose; A1C <7%; (or as determined by provider: _____)	**<u>Signs/symptoms of hypoglycemia:</u>** • Assess for increased activity or exercise, decreased food intake, timing of medication in relation to food intake, or alcohol consumption? • If present, consult. Consider lowering dose. • If A1C<5% or any blood sugar readings <60, consult. **Has patient reached treatment targets?** • If yes, then stop titration. Follow up at 3 months and check A1C. • If no, continue titration schedule. If already at suggested max dose, patient needs insulin initiation. Consult Insulin Guidelines.
TITRATION	If tolerating medication well but patient not at goal, titrate dose up. Increase dose from tobutamide 250mg 1 tablet before meals to TWO tablets before meals (max three times daily) Increase dose from tolbutamide 250mg TWO tablets before meals to THREE tablets before meals (max three times daily). Increase dose from tolbutamide 250mg THREE tablets before meals to FOUR tablets before meals (max three times daily.) MAX SUGGESTED DOSE: 1000mg/three times a day.
ONGOING MONITORING	• Monitor A1C level every 3 months if not at goal. If at goal, monitor A1C every 6 months. • If appropriate, consider consult w/ PCP for prescription change (to higher dose or combination pill) to reduce pill burden.
PATIENT EDUCATION	• Take 30 minutes before meal(s). • Hold if skipping meal (increased risk of hypoglycemia).

Special instructions:		
Provider Name:	**Provider Signature:**	**Date:**
RN Name:	**RN Signature:**	**Date:**

Glucose Control Algorithm

TYPE 2 DIABETES- Insulin Use

TREATMENT TARGETS:

A1C < 7%*
Fasting glucose 90-130 mg/dL

**Higher or lower A1C treatment targets may be appropriate in some pts (e.g., frail older adults and pts w/ life expectancy <5 yrs or during pregnancy).*

A1C > 10 at diagnosis, Severe symptoms, or A1C above target at max dose oral meds

Initiate Bedtime NPH

BMI < 25	BMI 25-30	BMI >30
0.1 units/kg	10 units	15 units

Titrate to target fasting blood sugar goal of 90-130:
Increase initial dose by 2 units (lean) to 4 units (obese) every 3-5 days to goal **OR** until dose of 40u NPH at bedtime reached **OR** to highest dose tolerated without low blood sugars.

FBG at goal but A1C still above goal after 12 wks

40 units NPH (or highest tolerated dose) at bedtime reached

BMI > 30

Continue titrating bedtime NPH until fasting blood sugar goal **OR** 60u NPH at bedtime reached

BMI < 30

FBG still > 130, or A1C above goal after 12 wks

Add Regular Insulin:

Initial dose: 4 units

A1C ≤ 8.5%:
Before meal causing highest BS
(SMBG approach)
Check pre-meal and bedtime BS for 1-2 weeks

A1C > 8.5%:
Before largest meal
(Empiric approach)

Titrate to target pre-prandial blood sugar goal of 90-130 at next meal :
Increase initial dose by 2 u (lean) to 4 units (obese) every 3-5 days until goal reached **OR** to highest tolerated without low blood sugars.
See reverse side for details

Add AM NPH:

Initial dose: 10 units

Titrate to target pre-dinner blood sugar goal of 90-130:
Increase initial dose by 2 units (lean) to 4 units (obese) every 3-5 days to goal **OR** 40 units NPH in AM reached **OR** to highest tolerated dose without low blood sugars.

A1C still above goal after 12 wks

FBG at goal but A1C still above goal after 12 wks

40 units NPH (or highest tolerated dose) in AM, but FBG > 130

no

yes

Add another dose Regular Insulin

Initial dose: 4 units before meal causing highest BS.
Use SMBG approach: Check pre-meal and bedtime BS for 1-2 weeks.

Titrate to target pre-prandial blood sugar goal of 90-130 at next meal:
Increase initial dose by 2 u (lean) to 4 units (obese) every 3-5 days.
(Process may be repeated for 3rd meal as needed.)
See reverse side for details

Refer to Diabetes Clinic

GOALS of INSULN ALGORITHM:

- Achieve HgbA1C goal.
- Avoid hypoglycemia.
- Blend *empiric management* and *self-monitored blood glucose (SMBG)* to optimize progress while catering to patient needs, preferences, education, and disease insight.
    - *Empiric*: Regular insulin is added based only on HgbA1C levels, with first dose preceding largest meal of day.
    - *SMBG*: Regular insulin is added immediately preceding the meal prior to time at which BGs are highest. Patients check blood glucose (BG) to obtain trend of BG for 1-2 weeks (Ideally pre-meals and at bedtime.)
- Provide guidelines for basic insulin titration for primary care providers in outpatient setting. *These guidelines should not replace or interfere with clinical judgment for a particular patient.* Some alternative methods for initiating and titrating insulin are listed below.

Rx FOR SUPPLIES:

Insulin vials:

- Each vial contains 10ml = 1000 units.
- Store in refrigerator prior to opening.
- Appearance: NPH and NPH-containing premixes = cloudy. Regular, glargine, aspart, lispro = clear
- In-use bottles can be used for one month and do not need to be refrigerated. Do not freeze insulin and do not expose to temperatures above 86°F. Avoid exposure to direct heat or light

Syringes (→30u, use 1/3mL, →50u, use 1/2mL, →100u, use 1mL syringe). Request 8mm (5/16") needle.
Sharps container (Once full may be brought to any SF Walgreens for disposal and replacement.)
Lancets (1 box), **test strips** (specify meter type in rx), **glucose tablets, glucagon injection kit**.
Insulin Pens: Typically require prior authorization. See "Tips" sheet.

TITRATION TIPS: If any hypoglycemic episodes, consider decreasing precipitating insulin dose by 10%

Insulin	When injected	target effect	Ensure no hypoglycemia
Regular	Pre-breakfast/lunch	Before next meal	Before next meal
Regular	Dinner	Bedtime	bedtime
Aspart	Premeal	2-4 hrs after meal	2-4 hrs after injection
Glargine	bedtime	Next day fasting bs	Overnight, during day, or anytime not related to mealtime
NPH	Before breakfast	Before dinner	6-10 hrs after injection
NPH	Before bedtime	Next day fasting bs	6-10 hours after bedtime
70/30	Before breakfast	Before lunch and dinner	Before lunch/dinner
70/30	Before dinner	At bedtime and next day fasting bs	Overnight and next day fasting bs

SAMPLE INSULIN REGIMENS

	Breakfast	Lunch	Dinner	Bedtime
1	--	--	--	NPH or glargine
2	glargine	--	--	--
3	NPH	--	--	NPH
5	NPH + R, or 70/30	--	NPH + R, or 70/30	--
6	NPH + R	--	R	NPH
7	NPH + (R or aspart)	R or aspart	R or aspart	NPH
8	R or aspart	R or aspart	R or aspart	glargine

Insulin Algorithm: Introduction

General Principles

- **The goal of insulin replacement is to mimic physiologic insulin needs as much as possible to achieve target blood sugars (without hypoglycemia) and thus decrease long-term microvascular complications.**

- **Many insulin regimens are available to address basal and prandial needs for insulin. The selection of the insulin regimen is individualized and depends on the patient's meal patterns, willingness to be involved in self-management, and what degree of glycemic control is desired.**

- **Any insulin regimen which is acceptable to the patient and can help achieve personal blood sugar goals without side effects is appropriate.**

- **When evaluating self-monitored blood glucose patterns and making adjustments to insulin, consider consistency of patterns, other variables such as the carbohydrate content of meals, regularity of meals, exercise patterns, illness, or severe medical or emotional stress. There is both intra- and interpersonal variability in the absorption and duration of action of insulin.**

- **General guidelines for establishing a *starting* dose of basal or prandial insulin are:**
  1. **Establish total daily dose (any of these methods are acceptable).**
     - **(for thin type 1) weight in lbs ÷ 4 <u>OR</u> weight in kg X 0.2-0.6 for type 1**
     - **(for overweight type 2) weight in lbs ÷ 2 <u>OR</u> weight in kg X 0.5-1 for type**
  2. **Half the total daily dose = basal insulin needs**
  3. **Half the total daily dose ÷ 3 = prandial insulin needs or divide in proportion to relative size of meals**
  4. **Adjust basal and mealtime insulin further according to results of self-monitored blood glucoses and A1C. Later, may use insulin-to-carb ratios for meals with patients who understand carbohydrate counting and desire more flexibility.**

- **Long-acting insulins may be used in combination with metformin, sulfonyureas, pioglitazone and alpha glucosidase inhibitors. Short and rapid acting insulins usually replace sulfonylureas.**

CHN Formulary

- See General Principles (p. 1) for estimating initial dose of insulin.
- The amount of A1C lowering from insulin is limited only by the risk of hypoglycemia.

Drug	Onset	Time of peak	Duration of action	PHS cost per 10mL vial*
Novolin R	½ - 1 hr	2-3 hrs	6-8 hrs	$3.81
Aspart (Novolog)	10-15 min	1-3 hrs	3-5 hrs	$7.26
Novolin N	2-4 hrs	6-10 hrs	14-18 hrs	$3.98
Glargine (Lantus)	1 hr	Theoretically none, although mild peak may occur in some individuals	10.8 - 24+ hrs	$28.19
Novolin 70/30	½ hr	2-12 hrs	Up to 24 hrs	$2.50

** PHS costs show the relative costs of different insulins. They are not the exact cost to either the CHN or the patient.*

Storage and Administration

- Keep vials of in-use insulin at room temperature below 86°F for up to 28 days. Keep unopened vials in refrigerator (not freezer).
- Injection in the abdomen has the quickest and most predictable absorption and is the preferred injection site for short and rapid-acting insulins, followed by the upper arms, thighs and buttocks which can be used for intermediate and long-acting insulins. Avoid massaging injection area or exercising the affected area which will hasten absorption.

Use with Caution

- Titrate and dose conservatively in patient with other comorbidities which may exacerbate the risk for hypoglycemia such as renal or hepatic dysfunction, patients who are elderly, have irregular access to food, have prolonged or irregular exercise, or who experience asymptomatic hypoglycemia.
- Alcohol suppresses hepatic glucose production, thus in patients on insulin, alcohol should only be consumed in moderation along with food to prevent subsequent hypoglycemia.

Pregnancy

All insulins listed may be used in pregnancy except glargine. Endogenous insulin can be found in breast milk. The gastrointestinal tract destroys insulin when administered orally; therefore, insulin use by a woman would not be expected to be absorbed intact by her breast-feeding infant.

Laboratory Monitoring

Check hbA1C every 3 months to monitor effect of therapy. Check serum creatinine periodically. Changes to insulin regimens may be made more frequently than 3 months depending on patterns of self-monitored blood glucose (see Troubleshooting sections of each insulin type).

Side Effects

- Common: hypoglycemia, injection site pain, lipodystrophy, pruritis, rash, weight gain
- Severe: severe hypoglycemia, hypokalemia, generalized hypersensitivity reaction, anaphylaxis (rare)

Other Metabolic Effects

- Overall weight gain of 2-4 kg is common in patients using insulin. Use of sulfonyureas with insulin is associated with greater weight gain; use of metformin with insulin is associated with less weight gain. Patients benefit from continued dietary modification and exercise to mitigate weight gain while on insulin.

Drug Interactions

- Drugs which reduce the hypoglycemic effect of insulin: oral contraceptives, corticosteroids, diltiazem, dobutamine, epinephrine, niacin, smoking and thiazide diuretics.
- Drugs which potentiate the hypoglycemic effect of insulin: alcohol, alpha-blockers, anabolic steroids, beta-blockers, clofibrate, guanethidine, MAO inhibitors, pentamidine, phenylbutazone, salicylates, sulfinpyrazone, tetracyclines.
- Nonselective beta-blockers may mask signs/symptoms of hypoglycemia. Cardioselective agents may be alternatives.

Regular insulin

Mechanism of Action
Regular human insulin is short-acting in onset (½ – 1 hr) and duration (6-8 hrs) and typically targets postprandial hyperglycemia. The CHN formulary includes Novolin R (human insulin injection [rDNA origin] USP).

CHN Formulary
No restrictions.

Dosing Instructions
- Regular insulin is a clear solution, typically given before meals, up to three times/day but may be fewer times depending on the patient's meal patterns.
- Inject subcutaneously 30 minutes before meal.

Troubleshooting
- The higher the dose of regular insulin, the longer the duration of action it may have.
- When regular insulin is given along with NPH, be aware of the possibility of hypoglycemia when their peaks overlap (i.e., 4-8 hrs after administration).
- May be used in combination with NPH, glargine or Novolin 70/30 depending on self-monitored blood glucose patterns and patient preference (see algorithm). May be mixed with NPH insulin but not glargine.
- The patient's sulfonylurea should be discontinued when initiating regular insulin.
- For patients who understand carbohydrate counting, an insulin-to-carbohydrate ratio using regular insulin can be used for mealtime coverage. This allows the patient more flexibility in determining the amount of carbohydrates consumed.
- For patients who do not count carbohydrates, eating similar amounts of carbohydrates for meals at the same time each day will help prevent wide fluctuations in blood sugars. Those patients may use a fixed dose of regular insulin with an additional correction factor to correct pre-meal hyperglycemia.
- For pre-meal hypoglycemia, patient should first treat the hypoglycemia, then eat her usual meal, then give regular insulin immediately after the meal. Skipping regular insulin completely will result in postprandial hyperglycemia. Delaying the regular insulin until after the meal will ensure the blood sugar rises with appropriate treatment of hypoglycemia and the subsequent meal, but will blunt the postprandial hyperglycemia.

If regular insulin is given…		*Then look for target effect…*	*Ensure hypoglycemia is not occurring…*	
Before breakfast	→	Before lunch	Before lunch	Titrate mealtime dose by 2 units (or 10-20% of dose) every 3 days to target BG without hypoglycemia at time of peak action
Before lunch	→	Before dinner	Before dinner	
Before dinner	→	Bedtime	Bedtime	

Aspart insulin

Mechanism of Action

Rapid acting analog insulins are structurally similar to human insulin but differ in pharmacokinetics. In lean patients with type 1 diabetes, its onset (10-15 min) and duration (3-5 hrs) more closely mimics physiological release of insulin to target post-prandial hyperglycemia. The CHN formulary includes Novolog (insulin aspart injection USP).

CHN Formulary

First prescriptions are restricted to providers of Diabetes Clinic, Endocrinology or Obstetrics. There are no restrictions for other providers providing subsequent refills.

Dosing Instructions

- Analogs are a clear solution, typically given before meals, up to three times/day but may be less depending on patient's meal patterns.
- Inject subcutaneously 5-15 minutes before meal.

Troubleshooting

- May be used in combination with NPH, glargine or Novolin 70/30 depending on self-monitored blood glucose patterns and patient preference (see algorithm). May be mixed with NPH insulin, but not glargine.
- The patient's sulfonylurea should be discontinued when initiating aspart insulin.
- For patients who understand carbohydrate counting, an insulin-to-carbohydrate ratio using aspart insulin can be used for mealtime coverage. This allows the patient more flexibility in determining the amount of carbohydrates consumed.
- For patients who do not count carbohydrates, eating similar amounts of carbohydrates for meals at the same time each day will help prevent wide fluctuations in blood sugars. Those patients may use a fixed dose of aspart insulin with an additional correction factor to correct pre-meal hyperglycemia.
- For pre-meal hypoglycemia, patient should first treat the hypoglycemia, then eat her usual meal, then give aspart immediately after the meal. Skipping the aspart completely will result in postprandial hyperglycemia. Delaying the aspart until after the meal will ensure the blood sugar rises with appropriate treatment of hypoglycemia and the subsequent meal, but will blunt the postprandial hyperglycemia.

If aspart insulin is given…		*Then look for target effect…*	*Ensure hypoglycemia is not occurring…*	
Before breakfast	→	Before lunch	2-4 hrs after breakfast	Titrate mealtime dose by 2 units (or 10-20% of dose) every 3 days to target BG without hypoglycemia at time of peak action
Before lunch	→	Before dinner	2-4 hrs after lunch	
Before dinner	→	Bedtime	2-4 hrs after dinner	

NPH insulin

Mechanism of Action

NPH insulin has a delayed onset (2-4 hrs) and intermediate duration of action (14-18 hrs) which targets hepatic glucose production, although during its peak (at 6-10 hrs), may have some coverage of postprandial hyperglycemia. The CHN formulary includes Novolin N (human insulin isophane suspension [rDNA origin]).

CHN Formulary

No restrictions.

Dosing Instructions

- NPH is a cloudy solution and must be re-suspended by rolling vial between palms before administering.
- Inject subcutaneously 1-2 times/day.

Troubleshooting

- NPH is typically given once daily at bedtime initially to target fasting hyperglycemia. NPH may be increased to twice daily if more than 30 units are needed at bedtime.
- Given the long peak action of NPH and the risk of hypoglycemia if not eating, patient should have regularly spaced meals if NPH is administered in the morning.
- NPH may be used in combination with regular or aspart insulin or as a part of Novolin 70/30 depending on self-monitored blood glucose patterns and patient preference (see algorithm). May be mixed with regular or aspart insulin.

If NPH insulin is given…		*Then look for target effect…*	*Ensure hypoglycemia is not occurring…*	Titrate dose by 2 units (or 10-20% of dose) every 3 days to target BG without hypoglycemia at time of peak action
Before breakfast	→	Before dinner	6-10 hrs after breakfast	
Before dinner	→	Next day FBG	6-10 hrs after dinner	
At bedtime	→	Next day FBG	6-10 hrs after bedtime	

Glargine insulin

Mechanism of Action

Modifications to analog insulins have resulted in longer-acting insulins that have slower absorption and more prolonged action, thus more closely approximating the basal levels of insulin in individuals without diabetes. Basal levels of insulin are needed to suppress hepatic glucose production. Glargine, which does not have a significant peak in most patients and lasts for 10.8 – 24+ hours, does not effectively treat postprandial hyperglycemia. The CHN formulary includes Lantus (glargine).

CHN Formulary

No restrictions for individuals with type 1 diabetes. Individuals with type 2 diabetes must first try NPH. If experiencing hypoglycemia on NPH, may then be prescribed glargine.

Dosing Instructions

- Glargine is a clear solution and cannot be mixed with any other insulins.
- Inject subcutaneously once daily (usually bedtime).

Troubleshooting

- Glargine is typically given once daily at bedtime, in conjunction with daytime regular or aspart insulin or oral agents like sulfonylureas which target postprandial hyperglycemia.
- When converting from twice daily NPH to once daily glargine, start glargine at 80% of the total daily dose of NPH.
- While theoretically a peakless insulin, some patients in fact experience a mild peak with glargine followed by a gradual waning. If glargine is given at bedtime, rising blood sugars by dinnertime (assuming the patient did not snack and the lunchtime prandial coverage is correct), suggests that glargine's effect is waning. Splitting the glargine dose to twice daily injections may smooth out control.
- The correct basal dose should maintain blood glucose in the normal range in the absence of food by suppressing inappropriate hepatic glucose output. Thus bedtime blood glucose should be similar to the next day fasting blood glucose. Bedtime blood glucoses that are significantly higher than the next day fasting blood glucose suggests that the dose of glargine may be too high. Similarly, bedtime blood sugars that are significantly lower than the next day fasting blood glucose suggests that the dose of glargine is inadequate.
- Another test of the basal insulin dose is to have the patient skip a meal (or eat only protein) and check blood sugars hourly until the next meal. If the blood sugars rise more than 30 mg/dL, the dose of glargine is inadequate.

If glargine insulin is given…		*Then look for target effect…*	*Ensure hypoglycemia is not occurring…*	
At bedtime	→	Next day FBG	overnight	Titrate dose by 2 units (or 10-20% of dose) every 3 days to target BG without hypoglycemia
Before breakfast	→	Before dinner	During the day	
Twice daily	→	Bedtime and FBG	Anytime not related to mealtime insulin	

Novolin 70/30

Mechanism of Action

Fixed premixed doses of intermediate acting and short acting insulins have been developed for less complicated insulin regimens. See information on separate components of NPH insulin and regular insulin. The CHN formulary includes Novolin 70/30 (70% NPH and 30% regular human insulin).

CHN Formulary

No restrictions.

Dosing Instructions

- Premixed insulins are cloudy and must be re-suspended by rolling vial between palms before administering.
- Inject subcutaneously 30-60 minutes before meal(s) once or twice daily.

Troubleshooting

- Novolin 70/30 is typically given to patients who are unwilling or unable to mix their own NPH and regular insulins or give multiple daily injections (3-4x/day). The fixed ratio of premixed Novolin 70/30 limits dosing flexibility.
- The patient's sulfonylurea should be discontinued when initiating Novolin 70/30 insulin.
- Patient should have regular meal and exercise patterns when using Novolin 70/30. Delays in meals or a change in exercise may result in hypoglycemia.
- Premixed insulin can be given once daily starting with the largest meal of the day, or twice daily before breakfast and dinner for individuals with high blood sugars before lunch and bedtime.
- Titration of dinner dose is limited by the risk of nocturnal hypoglycemia. If up-titration of the dinner dose paradoxically causes an increase in the fasting blood sugar, check for nocturnal hypoglycemia which may cause rebound hyperglycemia by the morning. If present, Novolin 70/30 may need to be separated out into regular insulin at dinner and NPH insulin at bedtime.
- Consider using in combination with regular insulin at lunch depending on self-monitored blood glucose patterns and patient preference (see algorithm).

If Novolin 70/30 insulin is given…		*Then look for target effect…*	*Ensure hypoglycemia is not occurring…*	
Before breakfast	→	Before lunch and dinner	Before lunch and dinner	Titrate dose by 2 units (or 10-20% of dose) every 3 days to target BG without hypoglycemia
Before dinner	→	At bedtime and next day FBG	Overnight and next day FBG	

WHAT TO PRESCRIBE YOUR PATIENT WHEN INITIATING INSULIN

- *For further support, you may refer patients to our monthly "Insulin Introduction" groups in **English** (3rd Tuesday) or **Spanish** (4th Tuesday). Send request by e-Referral to Diabetes Services. Your patient will be called to confirm date/time/location.*
- *If applicable, please prescribe the type of insulin, starting dose, syringes and sharps container for patient to bring to the "Insulin Introduction" group.*

Prior to starting insulin

- Does patient have the manual dexterity to use syringe/vial?
- Does patient have the visual acuity to use syringe/vial?
- Instruct patient on any changes to oral meds, starting insulin dose, self-titration schedule, changes to diet, when to check blood glucose.

If having difficulties, try insulin pens, magnifiers for vials or insulin pens, or devices that help load a pre-set dose for a syringe.

Rx: supplies for insulin vial & syringe users

- ❑ Sharps container
- ❑ Adequate supply of insulin for the month. In-use vials can be used for one. month and do not have to be refrigerated. Refrigerate unopened vials.
- ❑ Insulin syringes (all sizes available in the shorter 8mm (5/16") now.

Insulin vials (each vial contains 10 mL = 1000 units):

- Novolin Regular U-100
- Novolin 70/30
- Aspart *(1st rx by DM clinic, Endo or OB)*
- Novolin NPH
- Glargine *(type 1 OK, type 2 must have had repeated hypos on NPH)*

Syringes:
Up to 30 units, use 1/3 mL syringe, short needle (8 mm)
Up to 50 units, use ½ mL syringe, short needle (8 mm)
Up to 100 units, use 1 mL syringe, short needle (8 mm)

Rx: supplies for insulin pen users

- ❑ Sharps container
- ❑ Adequate supply of disposable pens for the month. In-use pens should be kept at room temperature. Refrigerate unopened pens.
- ❑ Pen needles

Insulin pens (each pen contains 3 mL = 300 units):

Insulin type	Pen device	Use by
Aspart (Novolog)	FlexPen	28 days
Lispro (Humalog)	Kwikpen	28 days
Humulin NPH	Original Lilly pen	14 days
Glargine (Lantus)	SoloSTAR	28 days
Humulin 70/30	Original Lilly pen	10 days
Novolog 70/30	FlexPen	14 days
Humalog 75/25	Kwikpen	10 days

** Disposable insulin pens are dispensed as 5 pens/box.*
** Availability of insulin pens depends on insurance. CHN formulary always requires prior authorization. Medi-Cal/Medicare varies. See "Tips for submitting PAs/TARs for insulin pens" on pg. 1.*
** Patients should pinch up the skin when using syringes or pen needles > 5 mm long to avoid injecting into muscle. 5mm length needles are appropriate for all body types regardless of weight, and are more comfortable than the longer needles.*

Pen needles:
Mini pen needles 1/4" (5 mm) 32 gauge
Short pen needles 5/16" (8 mm) 31 gauge
Original pen needles ½" (12 mm) 29 gauge

TIPS FOR SUBMITTING PA/TARS FOR INSULIN PENS

Medical justification

- Visual impairment preventing accurate use of vial/syringe.
- Motor impairment preventing accurate use of vial/syringe.
- Any other *compelling* reason.
- Chart notes may be requested and should substantiate justification. PA should explain justification in detail.

Prescribing from LCR:

- Go to Outpt Meds
  > Add Meds
  > Enter medication by typing the insulin brand (e.g., Novolog, Humalog, Lantus)
  > Select pen option from list
- Don't forget to prescribe pen needles separately.

CHN formulary (HSF, SFHP Hlthy Wrkr, Sliding Scale)—*need PA*

- Go to CHN IntraNet home page
  > Clinical Resources
  > Non-formulary Drug Request
  > CHN Prior Authorization Drug Request form
- Follow instructions on faxing PA to MedImpact

San Francisco Health Plan (SFHP)—*need PA*

- Go to www.sfhp.org
  > Providers
  > Download forms
  > Pharmacy Prior Authorization Request Form
- Follow instructions on faxing PA to iRx

Medi-Cal—*need TAR*

- TAR forms in all exam rooms (photocopies not accepted)
- Fax TAR to patient's pharmacy or to Medi-Cal directly

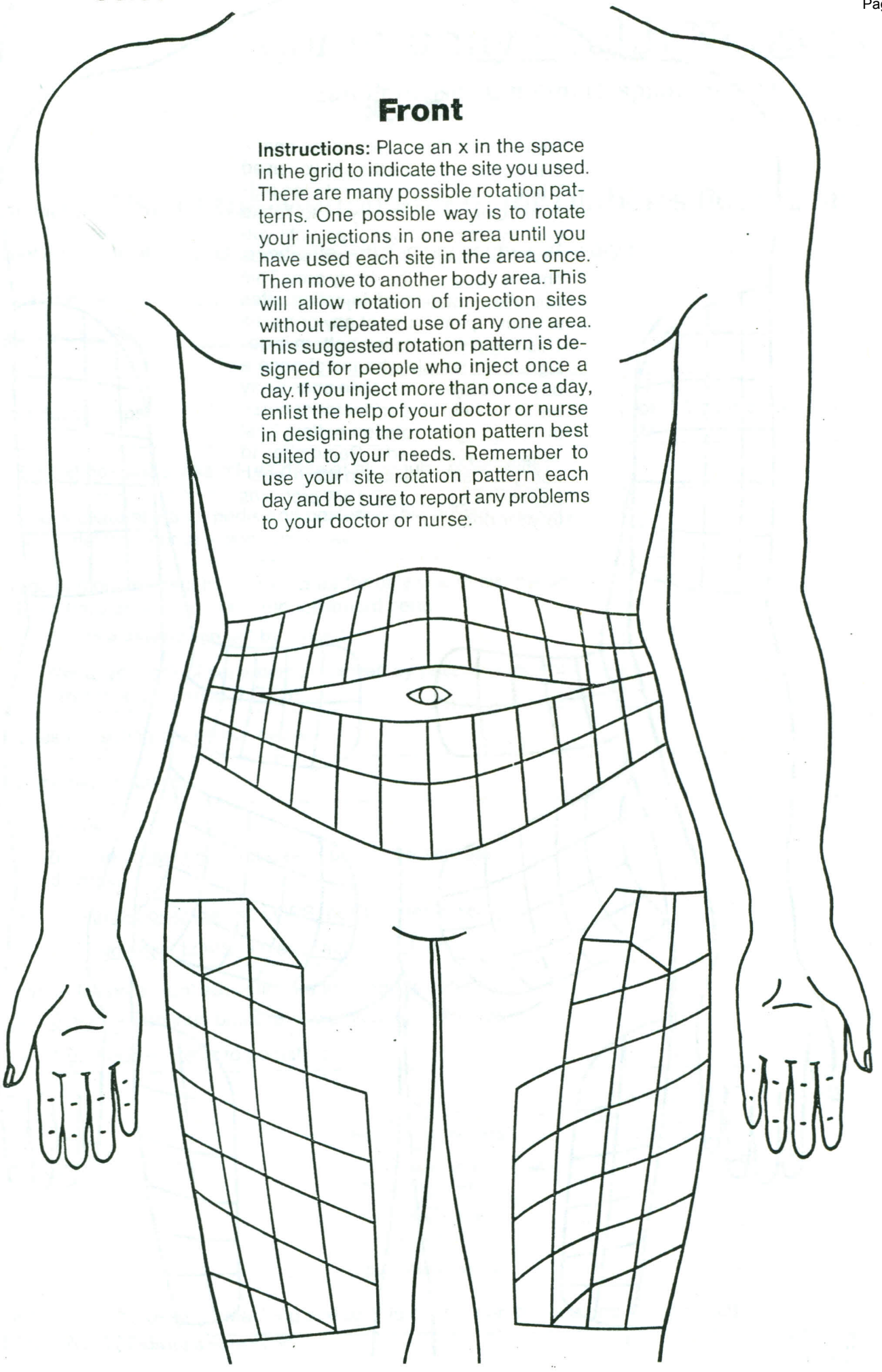
Medicare—*certain Prescription Drug Plans may cover certain insulin pens without PA*

- (option 1) Call the patient's pharmacy and get the patient's ID number and the PDP's 1-800#. Call the PDP directly and ask if PA is required. If yes, request for their specific PA form to be faxed. Some may allow PAs to be completed over the phone.
- (option 2) Go to the specific PDP's website to view its formulary and instructions for submitting PA request.
- (option 3) Use ePocrates to check on a specific PDP's formulary coverage for a specific insulin pen.

Selection and Rotation of Insulin Injection Sites

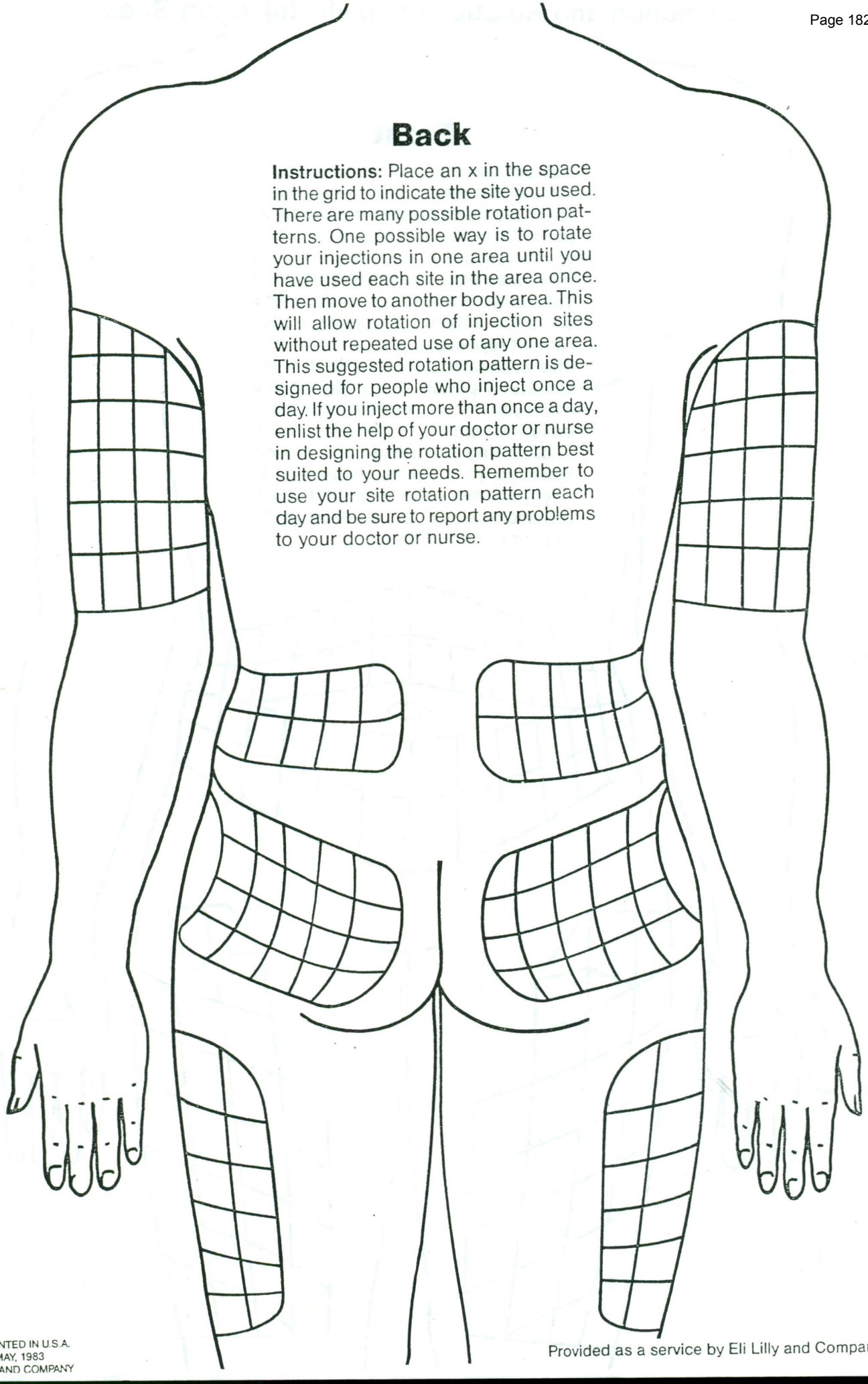
Front

Instructions: Place an x in the space in the grid to indicate the site you used. There are many possible rotation patterns. One possible way is to rotate your injections in one area until you have used each site in the area once. Then move to another body area. This will allow rotation of injection sites without repeated use of any one area. This suggested rotation pattern is designed for people who inject once a day. If you inject more than once a day, enlist the help of your doctor or nurse in designing the rotation pattern best suited to your needs. Remember to use your site rotation pattern each day and be sure to report any problems to your doctor or nurse.



Back

Instructions: Place an x in the space in the grid to indicate the site you used. There are many possible rotation patterns. One possible way is to rotate your injections in one area until you have used each site in the area once. Then move to another body area. This will allow rotation of injection sites without repeated use of any one area. This suggested rotation pattern is designed for people who inject once a day. If you inject more than once a day, enlist the help of your doctor or nurse in designing the rotation pattern best suited to your needs. Remember to use your site rotation pattern each day and be sure to report any problems to your doctor or nurse.



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COMMUNITY HEALTH NETWORK
OF SAN FRANCISCO

NAME

DOB

MRN

PCP

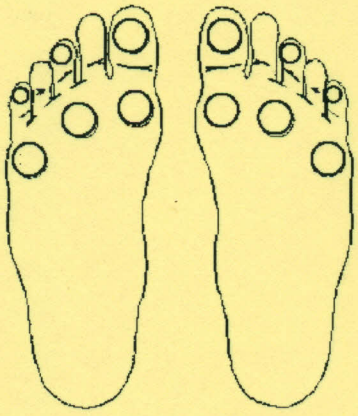
Client ID / Addressograph

Annual Diabetes Foot Screening Record

Did patient receive diabetes foot care information? ❒ Yes ❒ No

Foot Exam (using monofilament) **Mark (-) for no sensation. Mark (+) for sensation**

Right foot



Left foot

Date: _____ Time: _____ Name: _____ CHN ID #: _____
Print name Signature Title (if applicable)

Evaluation:	**Normal**	**Abnormal**	**Comment** (if applicable)
Monofilament Test			
Pulses			
Foot Shape			
Skin Condition			

Assign Risk:

- ☐ 0 No present risk. No LOPS no deformity
- ☐ 1 Impending risk. LOPS; no deformity
- ☐ 2 Intermediate risk. LOPS deformity/callous; no history of prior ulcer; poor circulation
- ☐ 3 High risk. LOPS: deformity/callous, +ulcer, hx of ulcer, amputation or poor circulation

* LOPS=loss of protective sensation

Follow-up Plan:

- ☐ Risk 0 ----------> Annual foot screening and patient education
- ☐ Risk 1, 2 or 3 ------> • Refer to podiatrist
  • Visual Screen at each PCP Diabetes focused visit
- ☐ Off-campus Podiatrist. Fax report to _____

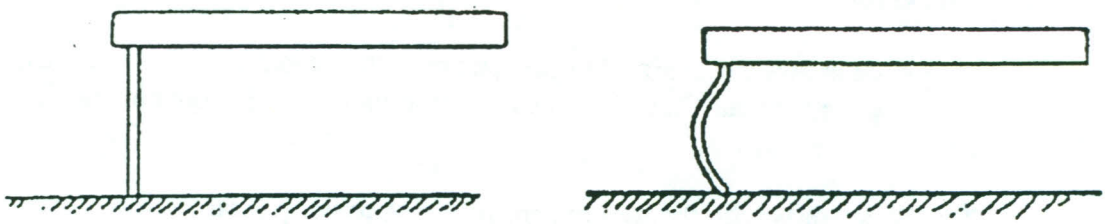
Date: _____ Time: _____ Provider: _____ CHN ID #: _____
Print name Signature Title (if applicable)

Filament Application Instructions

Note: The sensory testing device used with the FOOT SCREEN is a nylon filament mounted on a holder that has been standardized to deliver a 10 gram force when properly applied. Our research has shown that a patient who can feel the 10 gram filament in the selected sites will not develop ulcers.

Instructions for sensory testing on the foot:

1. Use the 10 gram filament provided to test sensation.
2. The sites to be tested are indicated on the Diabetic Foot Screen Form.
3. Apply the filament perpendicular to the skin's surface. (see diag. A)
4. The approach, skin contact and departure of the filament should be approximately 1 1/2 seconds duration.
5. Apply sufficient force to cause the filament to bend. (see diag. B)



A B

6. Do not allow the filament to slide across the skin or make repetitive contact at the test site.
7. Randomize the selection of test sites and time between successive tests to reduce the potential for patient guessing.
8. Ask the patient to respond "yes" when the filament is felt and record response on the Diabetic Foot Screen Form.
9. Apply the filament along the perimeter of and NOT on an ulcer site, callous, scar or necrotic tissue.

ATTENTION

LOST or BROKEN

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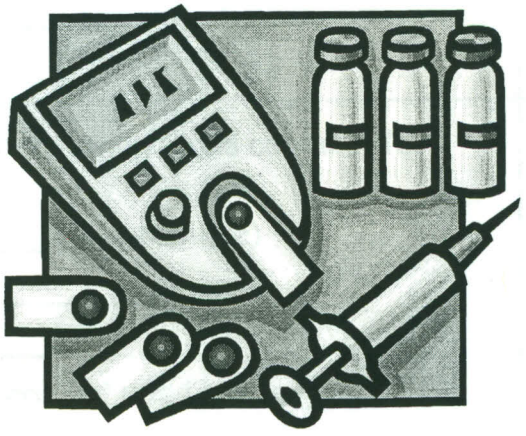

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CDC CLINICAL REMINDER

Use of Fingerstick Devices on More than One Person Poses Risk for Transmitting Bloodborne Pathogens

Summary: The Centers for Disease Control and Prevention (CDC) has become increasingly concerned about the risks for transmitting hepatitis B virus (HBV) and other bloodborne pathogens to persons undergoing fingerstick procedures for blood sampling -- for instance, persons with diabetes who require assistance monitoring their blood glucose levels. Reports of HBV infection outbreaks linked to diabetes care have been increasing[1,2,3]. This notice serves as a reminder that fingerstick devices should never be used for more than one person.

Background

Fingerstick devices are devices that are used to prick the skin and obtain drops of blood for testing. There are two main types of fingerstick devices: those that are designed for reuse on a single person and those that are disposable and for single-use.

Figure 1: Reusable fingerstick devices*

- **Reusable Devices:** These devices often resemble a pen and have the means to remove and replace the lancet after each use, allowing the device to be used more than once (see **Figure 1**). Due to difficulties with cleaning and disinfection after use and their link to numerous outbreaks, CDC recommends that these devices never be used for more than one person. If these devices are used, it should only be by individual persons using these devices for self-monitoring of blood glucose.

- **Single-use, auto-disabling fingerstick devices:** These are devices that are disposable and prevent reuse through an auto-disabling feature (see **Figure 2**). In settings where assisted monitoring of blood glucose is performed, single-use, auto-disabling fingerstick devices should be used.

Figure 2: Single-use, disposable fingerstick devices*

The shared use of fingerstick devices is one of the common root causes of exposure and infection in settings such as long-term care (LTC) facilities, where multiple persons require assistance with blood glucose monitoring. Risk for transmission of bloodborne pathogens is not limited to LTC settings but can exist anywhere multiple persons are undergoing fingerstick procedures for blood sampling. For example, at a health fair in New Mexico earlier this year, dozens of attendees were potentially exposed to bloodborne pathogens when fingerstick devices were reused to conduct diabetes screening.

Recommendations

Anyone performing fingerstick procedures should review the following recommendations to ensure that they are not placing persons in their care at risk for infection.

- Fingerstick devices should **never** be used for more than one person.
- Auto-disabling **single-use** fingerstick devices should be used for assisted monitoring of blood glucose.

These recommendations apply not only to licensed healthcare facilities but also to any setting where fingerstick procedures are performed, including assisted living or residential care facilities, skilled nursing facilities, clinics, health fairs, shelters, detention facilities, senior centers, schools, and camps. Protection from infections, including bloodborne pathogens, is a basic requirement and expectation anywhere healthcare is provided.

Additional information is available at:

http://www.cdc.gov/injectionsafety/blood-glucose-monitoring.html

http://www.cdc.gov/hepatitis/Settings/GlucoseMonitoring.htm

http://www.fda.gov/MedicalDevices/Safety/AlertsandNotices/ucm224025.htm

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Everyone has a stake in patient safety.
For Roche Diagnostics, it's always been a top priority.

Our commitment: helping you prevent medical errors.

Roche Diagnostics is committed to communicating important information about patient safety issues to help you ensure the highest quality of patient care. The table below provides a summary of up-to-date information about drug/device interference.

The facts about drug interferences

HIGHER EXPOSURE LOWER

TRADE NAME	MANUFACTURER / U.S. DISTRIBUTOR	DESCRIPTION	ESTIMATED INPATIENT UNITS SOLD IN THE U.S.–2007	ALTERNATIVE MEDICATION OPTION AVAILABLE
EXTRANEAL® (contains icodextrin)	Innovata plc Baxter BioSurgery	Dialysis solution used for peritoneal dialysis[1]	Units unknown 25,895 U.S. peritoneal dialysis patients (inpatient and outpatient) in 2005 (accessed on June 30, 2008)[2]	Yes
Octagam® 5%	Octapharma	IV immune globulin solution for treating primary and secondary immunodeficiency diseases[3]	154K inpatient units (accessed on June 27, 2008)[4]	Yes
WinRho® SDF Liquid	Cangene*	Specific IV immune globulin for treatment of ITP and Rh transfusion reactions[5]	61K inpatient units (accessed on June 27, 2008)[4]	Yes
Orencia® (Abatacept)	Bristol-Myers Squibb	Selective IV immunosuppressant drug for treatment of rheumatoid arthritis[6]	3K in 2006 (accessed on May 24, 2007)[7] (2007 IMS data unavailable)	Listed with the FDA as no therapeutic equivalents[8]
ADEPT® Adhesion Reduction Solution (4% Icodextrin)	Innovata plc Baxter BioSurgery	A fluid used during or after laparoscopic gynecological surgery to separate and protect tissues and decrease the number of new adhesions after surgery[9]	New to market 2006[10] (2007 IMS data unavailable)	Unknown
HepaGam B™	Cangene**	For acute exposure to blood containing HBsAg, exposure to HBsAg-positive persons or persons with acute HBV infections[11]	5K inpatient units (accessed on June 27, 2008)[4]	Unknown
BEXXAR®	Corixa Corporation GlaxoSmithKline***	Radioimmunotherapy for treatment of non-Hodgkins lymphoma[12]	2K units (accessed on June 27, 2008)[4]	Listed with the FDA as no therapeutic equivalents[8]
D-Xylose USP **(Last lot expires 1/31/2009)**[13]	NERL Diagnostics	Oral liquid diagnostic test for malabsorption[14]	**No longer available** (accessed on January 15, 2008)[13]	Yes
Gamimune® N 5% **(Last lot expires 12/20/2008)**[15]	Talecris	IV immune globulin solution for treating primary and secondary immunodeficiency diseases[16]	**No longer available** (accessed on January 31, 2008)[15]	Yes
Vaccinia Immune Globulin (Human)	Cangene	IV immune globulin for treatment of adverse reactions caused by smallpox vaccine[17, 18]	**Not available for sale in the U.S. as of July 13, 2006 (CDC stockpile drug)**[19]	NA

*Preliminary calculations suggest that, when WinRho SDF liquid is administered at the recommended dose for Rh sensitization, the peak blood concentration of maltose is unlikely to have clinically significant interference with glucose testing by GDH-PQQ-based methods[20]

**Preliminary calculations suggest that, when HepaGam B is administered at the recommended dose, the peak blood concentration of maltose is unlikely to have clinically significant interference with glucose testing by GDH-PQQ-based methods[21]

***Preliminary calculations suggest that, when BEXXAR is administered at the recommended dose, the peak blood concentration of maltose is unlikely to have clinically significant interference with glucose testing by GDH-PQQ -based methods[22]

Drug Interference Safety Recommendations

To reduce the risk of reliance upon potentially false glucose meter readings, consider the following:

- Create alerts in the pharmacy computer system
- Communicate with staff
- Include description of risk in insulin administration protocols and utilize alternative testing methods when the patient is receiving medications which contain maltose or result in maltose being present in the patient's bloodstream
- Assess the patient's condition before administering insulin based on a glucose result
- Establish guidelines for early recognition of errors and prompt recourse in the event an error has occurred
- Educate patients
- Consider new product formulations

References:

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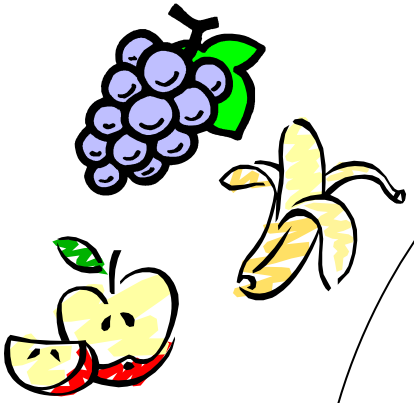
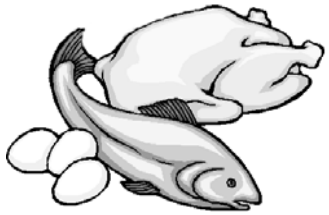
HEALTHY FOOD CHOICES
YOUR PLATE

Fruits



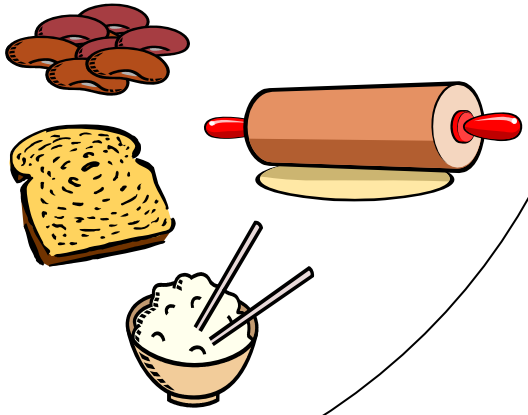
Milk

Protein



Vegetables

Starch



Fat

Eat 3 meals a day

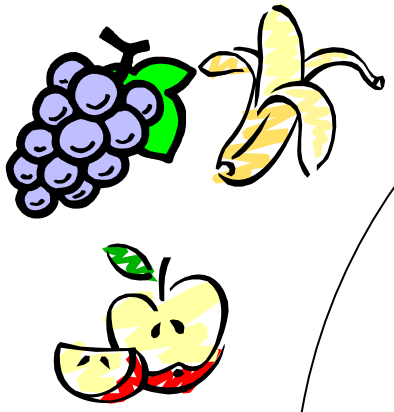
Drink Water

No special foods needed

San Francisco Department of Public Health
San Francisco General Hospital Medical Center, 2/04,4/11

Alimentos Sanos – Su Plato

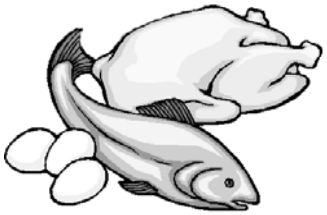
Frutas



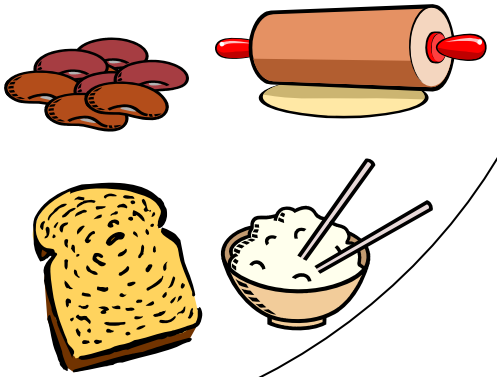
Leche

Verduras

Proteina



Almidones



Grasas

Come 3 veces al dia

Tome agua

No necesita compra comidas especiales

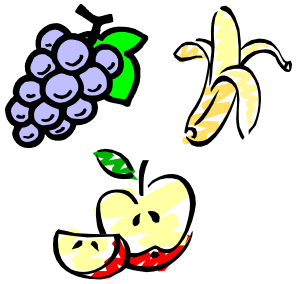
San Francisco Department of Public Health
San Francisco General Hospital Medical Center,

Healthy Food Choices: Your Plate

Fruits

1 small apple, banana, pear, orange, peach
12 grapes, cherries;
1 cup melon
1 cup strawberries, cantaloupe

2-3 servings per day



Eat 3 Meals a Day

Drink Water

No special foods

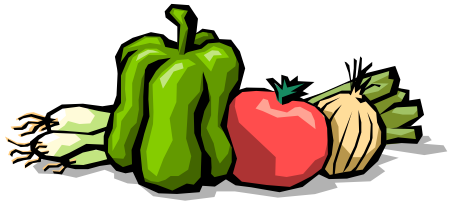
Vegetables

Fresh or frozen

½ of your plate

lettuce, cucumber, tomato
broccoli, carrots, cabbage
pepper, zucchini, cauliflower
spinach, asparagus,
green beans, chiles, chayote,
eggplant

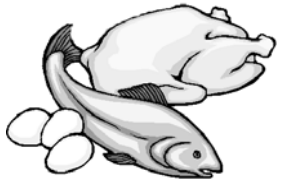
1-2 cups



Protein

¼ of your plate

cuts



2-4 ounces

tofu, egg whites, eggs, peanut butter; cottage cheese (non fat); Mozzarella cheese

Starch

¼ of your plate

Choose whole grains: whole wheat bread, whole wheat pasta, oatmeal, brown rice, corn tortilla. Beans

Starchy vegetables: corn, potato, peas, plantain, yucca, pumpkin, squash

2-3 oz or 1 Cup

Milk

MILK: nonfat or 1% low fat milk;
YOGURT: nonfat, low fat, light
Soymilk: calcium fortified

1 cup

Healthy Fats

canola or olive oil, seeds, nuts, avocado

Use Little
1-2 teaspoons

Amounts listed are for ONE meal

Alimentos Sanos – Su Plato

Frutas

1 manzana, pera, naranja, durazno, banano (pequeños)
12 uvas o cerezas
1 taza sandia, fresas, melón

2-3 porciones por día

Coma 3 veces al día

Tome agua

No necesita compra comidas especiales

Verduras

Frescas o congeladas
La mita del plato

lechuga, pepino, tomate, brócoli, zanahoria, repollo pimiento dulce, coliflor, calabacita, espinaca, espárrago, frijoles de vaina, ejotes

1-2 tazas

Proteína

Un cuarto del plato

pollo, pavo, sin pellejo,
cortes de lomo: puerco,
carne de res magros,
pescado "chunk light" atún en agua
tofu, huevos/substitutos; crema de maní,
requesón, descremado

2-4 onzas

Leche

Leche: descremada o 1% "lowfat"
Yogurt: ligero "Light", sin grasa, bajo en grasa
Bebida de soya: fortificada con calcio

Almidones

Un cuarto del plato

Escoja granos integrales como pan integral; tortillas, avena, fideos, arroz cafe

frijoles;
verduras con almidón:
elote, chícharos, papa
plátano macho
camote, yuca, calabaza
2-3 onzas o
1 taza

Grasas

aceite de canola o oliva, nueces, maní, aguacate
use poco
1-2 cucharaditas

Las cantidades corresponden a UNA comida