

JOSLIN DIABETES CENTER AND JOSLIN CLINIC
GUIDELINE FOR THE CARE OF THE OLDER ADULT WITH DIABETES
07/16/2015

The *Joslin Guideline for the Care of the Older Adult with Diabetes* is designed to assist primary care physicians, specialists, and other healthcare providers address the unique challenges and issues of the older person with diabetes. The guideline should be used in conjunction with ***Joslin's Clinical Guideline for Adults with Diabetes*** as well as ***Joslin's Clinical Guideline for Pharmacological Management of Adults with Type 2 Diabetes***. The guidelines are not intended to replace sound medical judgment or clinical decision-making and may need to be adapted for certain patient care situations where more or less stringent interventions are necessary. This guideline will be reviewed periodically and Joslin Diabetes Center will maintain, upgrade or downgrade the rating for various recommendations when new evidence mandates such changes. At the end of the document is an appendix giving examples of exercise and nutrition prescriptions, depression screening and more detailed descriptions for activities of daily living.

The primary goal of diabetes management in older adults is to achieve balance between optimal glycemic control to prevent and/or slow the onset and progression of acute and chronic complications, while avoiding hypoglycemia and its consequences. ***Hypoglycemia can result in worse outcomes in older adults as it can lead to traumatic falls and worsening of chronic conditions such as cognitive dysfunction. Therefore, in many cases, aggressive treatment may not be appropriate if the older adult's comfort, safety, and overall quality of life are thereby compromised, or if aggressive treatment may not improve outcomes. Recent consensus on the management of diabetes recommends individualization of treatment goals based on coexisting medical conditions, cognitive status, functionality and available resources. The older adult's view on illness, health and aging should also be considered.*** Appropriate support systems for complex diabetes are not uniformly available nationwide. As a result, treatment decisions become more complex as the capacity to cope with self-care declines.

To assist with self-care, education strategies also require adaptation for aging. Learning new diabetes self-management skills may be difficult for older people, increasing the need for education to proceed in a simple, step-like manner. Cognitive dysfunction, depression and functional disabilities (such as poor eyesight, hearing deficit, and a decline in dexterity) are important issues to consider when assessing the ***older adult's*** ability for self-care. Involvement of family members or friends may be required to assure appropriate self-care and adherence to treatment programs.

Portions of this guideline are based upon recommendations of the International Diabetes Federation's Global Guideline for Managing Older People with Type 2 Diabetes and the American Diabetes Association's Consensus Report on Diabetes in Older Adults.

Joslin's Guidelines are evidence-based. In order to allow the user to evaluate the quality of the evidence used to support each standard of care, a modification of the GRADE system has been adopted. The table provided on page 20 describes the categories in which methodological quality and strength of recommendations have been classified. Evidence levels are graded 1A through 2C, as indicated in brackets. Where evidence is not graded, recommendations are made based on the expertise of the Clinical Oversight Committee.

GENERAL CONSIDERATIONS

- In determining treatment plans and goals, individualized patient assessment is required, being cognizant of the following:
 - o Chronological age vs. actual health status
 - o Duration of disease and age of onset (for example: older onset type 2 diabetes is more prominent in non-Hispanic whites and is associated with a lower likelihood of insulin use than middle age onset; retinopathy is more likely to occur in middle-age rather than older-age onset diabetes. There is no difference in CAD or neuropathy prevalence in middle vs older age onset)
 - o Presence of complications and co-morbidities
 - o Life expectancy
 - o Social support system
 - o Financial status
 - o Patient preferences
- Treatment programs should be simplified to decrease the potential of medication errors and to avoid overwhelming the patient and their caregivers.
- Treatment goals should be re-assessed at frequent intervals as health status can change quickly in older adults.

GERIATRIC SYNDROME

The table below lists a group of conditions called *geriatric syndrome* which occur more frequently in older adults with diabetes. These conditions can interfere with patients' ability to perform self-care activities and make healthcare more challenging for the older adult and for their caregivers. The table below includes the condition, possible clinical presentations, commonly used short clinical screening tests and suggested modifications to treatment plans and goals to compensate for the condition. Listed are links to various cognitive tests: http://www.alz.org/documents_custom/minicog.pdf, http://dementia.ie/images/uploads/site-images/MoCA-Test-English_7_1.pdf, http://www.commonwealthfund.org/usr_doc/PHQ2.pdf

CONDITION	CLINICAL PRESENTATION	SHORT SCREENING TESTS	MODIFICATION TO TREATMENT PLANS AND GOALS
Cognitive Dysfunction	<ul style="list-style-type: none"> • Decline in self-care and/or worsening of glycemic control without clear etiology • Appears stubborn or not able to follow instructions. • Seems uninterested in helping themselves • Makes errors especially when problem solving 	<ul style="list-style-type: none"> • Clock drawing test • MiniCog test • Montreal Cognitive Assessment Test (MoCA) 	<ul style="list-style-type: none"> • Avoid tight glucose control and complex diabetes medication programs • Educate caregivers and seek their support in managing the person's diabetes • Repeat important education topics at each visit e.g. how to recognize and treat hypoglycemia • Avoid diabetes medications that have a risk of hypoglycemia as the hypoglycemia may go unnoticed and untreated • Recommend reminders, such as alarms, notes and pill boxes, for taking medications or meals
Depression	<ul style="list-style-type: none"> • Seems uninterested in helping themselves • Is less interested in activities • Seems overwhelmed with life events 	<ul style="list-style-type: none"> • Patient Health Questionnaire (PHQ-2) • Geriatric Depression Scale 	<ul style="list-style-type: none"> • Assess and treat depression

	<ul style="list-style-type: none"> • Has a decline in self-care and/or worsening of glycemic control without clear etiology 		
Physical Disabilities <ul style="list-style-type: none"> • Vision impairment • Hearing loss • Gait abnormality 	<ul style="list-style-type: none"> • Dosing errors • Discrepancies between log book and meter download • Disinterest in conversation • Inactivity, lack of follow up with exercise recommendations • Reports of falls 	<ul style="list-style-type: none"> • Vision and hearing screening • Physical exam to evaluate for peripheral neuropathy • Ask about recent falls and fear of falls • Assess for risk factors for falls • Bone density study to evaluate bone health and fracture risk 	<ul style="list-style-type: none"> • Recommend use of assistive devices for vision and hearing impairment such as hearing aids, talking glucose meters, glucose meters with large read outs, magnifiers • Recommend use of assistive devices such as cane or walker for balance and gait issues • Recommend safe venue, supervised exercise program/physical therapy • Recommend an exercise program that is suitable for the patient's current level of activity, e.g. wheel-chair exercises, exercise pedals, etc.
Malnutrition/Weight Loss	<ul style="list-style-type: none"> • Weight loss • Dental issues 	<ul style="list-style-type: none"> • Nutrition assessment tools e.g., DETERMINE survey 	<ul style="list-style-type: none"> • Avoid restrictive diets; encourage adequate calories, hydration, protein intake, nutrition supplements. <ul style="list-style-type: none"> ▪ Consider Meals on Wheels if unable to shop/cook for self ▪ Consider communal meals at senior centers if socially isolated ▪ Consider community food pantries if finances impede healthy food purchases. • Encourage regular dental checkups
Polypharmacy/ Medication non-adherence	<ul style="list-style-type: none"> • Fluctuations in glucose, BP, and/or cholesterol levels • Inability to accurately list name and doses of medications • Voices lack of trust in medication safety or efficacy • Appears overly medicated 	<ul style="list-style-type: none"> • Carefully reconcile medication list at each visit • Assess for lack of resources 	<ul style="list-style-type: none"> • Ask patient to carry current medication list with them • Ask patient what he/she actually takes on the list of medications they carry • When possible, discontinue medications that have no clear benefit • Look for medication side effect or drug-drug interaction as the possible cause of any new symptoms • If needed, review patient's medication refill history with their pharmacy • Refer patient/family to financial resources to assist with obtaining needed medications

DIAGNOSIS

See Joslin's *Clinical Guideline for Adults with Diabetes* for more details.

CDC data indicates that about half of older adults have prediabetes. It is recommended that all adults ≥ 45 years of age be screened for diabetes every 1-3 years with an A1C, fasting glucose, or oral glucose tolerance test. This recommendation should be modified for those with shorter life expectancies and those with multiple comorbidities.

TREATMENT GOALS [MODIFIED FOR HEALTH STATUS (adapted from the American Diabetes Association)]

See Joslin's *Clinical Guideline for Adults with Diabetes* for more details. Treatment goals for A1C, glucose levels, blood pressure and lipids should be modified for the older adult based on patient characteristics and on health status. See chart below

Patient characteristics/health status	Rationale	A1C	Fasting or postprandial glucose (mg/dL)	Bedtime glucose (mg/dL)	BP (see BLOOD PRESSURE section in this guideline for details) (mmHg)	Lipids (see LIPID section in this guideline for details)
Healthy <ul style="list-style-type: none"> Few co-existing chronic illnesses* Intact cognitive status intact functional status 	<ul style="list-style-type: none"> Longer life expectancy 	<7.5% [1C]	80-130	90-150	<140/90 [2B]	Statins (unless not tolerated) [1B]
Complex/Intermediate <ul style="list-style-type: none"> Multiple co-existing chronic illnesses* Mild-moderate cognitive impairment 2+ Instrumental Activities of Daily Living (IADL)** 	<ul style="list-style-type: none"> Intermediate life expectancy High treatment burden Hypoglycemia vulnerability Fall risk 	<8% [2C]	90-150	100-180	<150/90 [2C]	Statins unless not tolerated [1C]
Very Complex/Poor Health <ul style="list-style-type: none"> LTC care residents End-stage chronic illnesses Moderate-severe cognitive impairment 2+ Activities of Daily Living (ADL) dependencies*** 	<ul style="list-style-type: none"> Limited life expectancy Benefits uncertain 	<8.5% [2C]	100-180	110-200	<150/90 [2C]	Consider stopping statin use if expected longevity is less than 1 year [2C]

***Coexisting chronic illnesses:** conditions serious enough to require medication or lifestyle management and may include arthritis, cancer, congestive heart failure, depression, COPD, falls, and chronic renal failure.

****IADL:** measures functioning in travelling, shopping, housework, managing finances, using the telephone, and taking medications

*****ADL:** measures the 5 basic functions of bathing, toileting, dressing, transferring, and eating.

EDUCATION:

Education strategies require adaptation for aging. Simplify and focus programs:

- Use focused educational material that is easy to follow and excludes extraneous information.
- Provide individual rather than group education if the patient has cognitive or physical deficits.
- Focus on one or two topics at a time. Repetition and re-education are needed for many older adults
- Education sessions should be slow-paced, with instruction occurring in steps.
- Multiple sessions may need to be scheduled, to prevent "information overload".
- Use memory aids (e.g., personalized handouts) to reinforce points made during face-to-face sessions.
- When possible, simplify the patient's medication program especially for those who have multiple medical problems, cognitive dysfunction, or functional disability (e.g., changing insulin to 2 injections a day from 4 injections a day).
- When discussing medications, focus education on medication adherence by using charts, pill boxes and other reminders,
- Caregivers should be instructed to/how to track amount of medication used.
- Educate the patient that uncommon symptoms such as confusion, dizziness, and weakness can be manifestations of hypoglycemia.
- Involve caregiver or arrange for visiting nurse evaluation if medication adherence is an issue.
- Provide very specific guidelines on when the patient and/or caregiver should call the healthcare provider for assistance

DEVICES:

- Recommend equipment that is easy to hold, easy to read and requires the least number of steps.
- Insulin pens, pens that contain non-insulin glucose lowering medication and pre-filled syringes may be easier for older patients to use than manipulating a syringe and vial. Syringe magnifiers are available if vision is impaired.
- For some patients, Inhaled insulin may be another option for prandial insulin.
- Choose blood glucose meters that have a large display, are easy to hold and use, and that minimize handling of strips and lancets. "Talking meters" are available for those with vision impairment.

MONITORING:

- Emphasize the importance of regular self-monitoring of blood glucose (SMBG), especially before driving or using power tools.
- Checking glucose levels at different times of the day, different days of the week will allow the provider to assess glucose patterns throughout the day without having the patient check the glucose several times each day. For example: check the fasting and pre-supper glucose level one day and pre-lunch and bedtime another day.
- Some older adults may not be able to perform SMBG due to physical or cognitive impairment. To decrease the risk of hypoglycemia in these situations, glycemic goals may need to be adjusted and medication programs may need to be simplified. In type 2 diabetes, if appropriate, use diabetes medications that have a low risk for hypoglycemia
- Develop a plan to treat hypoglycemia. Encourage the patient to carry a source of glucose on their person and to have at the bedside at all times.
- Develop a sick day plan
- Encourage caregivers to accompany patients to education sessions and receive appropriate education in glucose monitoring and blood glucose interpretation

DRIVING:

- Referral for education and counseling should be advised if the patient's ability to drive is in question. Organizations such as local elder services, the American Geriatric Society <http://www.americangeriatrics.org/press/id:5193> and the various States' Registry of Motor Vehicle departments <http://www.massrmv.com/rmv/medical/reporting.htm>, have additional information for patients as well as family members.
- Drive-wise programs, where available can be useful to assess patient's ability to drive

NUTRITION CHALLENGES: (See appendix for examples of nutrition prescriptions)

Although diabetes nutritional guidelines for the older adult are no different than for younger adults, unique challenges often exist due to:

- Lack of motivation
- Impaired food shopping or preparation capabilities
- Omission of meals due to cognitive dysfunction or depression
- Compromised dentition
- Altered taste perception
- Altered gastrointestinal function
- Weight loss and malnutrition
- Co-existing illnesses
- Limited finances

NUTRITION RECOMMENDATIONS:

Consider referral to a dietitian to work with the older adult patient and caregivers to:

- Assess nutritional needs
- Avoid making unnecessary dietary changes in life long eating habits, remembering that multiple changes may be required to treat co-existing illnesses such as reducing potassium, sodium, and dietary fats
- Minimize the complexity of meal planning and engage the spouse, or others living with the patient, in creating a home environment that supports positive lifestyle change
- Educate how consistency in carbohydrate intake and meal timing can help minimize fluctuations in blood glucose levels as well as help maintain or achieve a reasonable weight
- Consider giving prandial insulin after the meal rather than before, based on carbohydrate intake
- Assess the ability to buy and prepare healthy meals
- Help maximize a limited food budget
- Suggest community resources such as Meals-On-Wheels

WEIGHT LOSS/POTENTIAL MALNUTRITION:

- Weight loss diets commonly recommended to younger adults should be prescribed with great caution to the older adult, since under-nutrition/malnutrition is often more of a problem than obesity in the older adult.
- Weight loss and the potential for malnutrition should be carefully monitored especially after acute illness, hospitalization, and social stress.
 - Use serial weights to monitor changes.
- To avoid weight loss, it may be necessary to let patients eat what they enjoy and adjust diabetes medications accordingly

CHRONIC CARE SETTING:

- In chronic care settings, there is no need for a rigid and restrictive meal plan. A regular meal plan with consistent, moderate carbohydrate intake may be sufficient and may help avoid under nutrition.

PHYSICAL ACTIVITY (See appendix for examples of activity prescriptions)

BENEFITS OF ACTIVITY

Physical activity should be stressed in all older adults as it is crucial in maintaining functionality, independence, and acceptable quality of life.

- Regular exercise program offers other benefits to older adults, such as:
 - Reduced glucose levels
 - Improved lipid profile
 - Improved blood pressure
 - Increased muscle tone and strength
 - Improved gait and balance
 - Overall physical conditioning
 - Decreased depression, and an overall sense of improved well-being.

TYPES OF ACTIVITY

- Types of physical activities that may be appropriate for the older adult should take into account the current level of physical fitness/ disability. It is important to develop an activity program to increase mobility, endurance, and strength and to increase the duration of the activity gradually.

Common activities to achieve these goals include:

- Aerobic activities
- Walking
- Swimming or water aerobics
- Stationary/ bicycle riding
- Resistance training
- Armchair exercises
- Weight lifting
- Balance exercise
- Tai Chi
- Yoga
- Flexibility
- Other physical activities:
 - Gardening
 - Household chores

CHALLENGES TO CONSIDER

- Challenges to maintaining a regular physical activity program include:
 - Fluctuations in health
 - Co-morbidities, such as cardiovascular disease, osteoarthritis and osteoporosis
 - Risk and fear of falls

- Finding a safe environment for exercise
- Issues with transportation
- Hypoglycemia
 - The risk of hypoglycemia is increased among those using insulin and other diabetes medications that can cause hypoglycemia. More frequent SMBG may reduce this risk.
- An exercise physiologist, physical or occupational therapist can provide a supervised environment to help a patient perform exercises safely.

MEDICATIONS:

GENERAL CONSIDERATIONS

General principles to consider when prescribing medications to an older adult include:

- “Start low and go slow” when dosing and titrating medications
- Agents with low risk of hypoglycemia are preferred in this age group
- Consider drug-drug interactions carefully as most older adults are on multiple medications as well as supplements.
- Evaluate renal function using the estimated glomerular filtration rate (eGFR) rather than serum creatinine as low muscle mass in the older population may result in a “normal” creatinine level despite significant renal dysfunction
- Monitor liver and kidney function tests periodically
- Assess financial resources when using newer generally more expensive agents

NON-INSULIN GLUCOSE LOWERING MEDICATIONS

Please also refer to Joslin’s *Clinical Guideline for Pharmacological Management of Adults with Type 2 Diabetes* for more detailed information on diabetes medications

ORAL ANTIDIABETIC MEDICATIONS For additional detail see <i>Joslin’s Pharmacological Guideline</i>				
MEDICATION CLASS	MECHANISM OF ACTION	ADVANTAGES	DISADVANTAGES	CAVEATS in the OLDER POPULATION
<p style="text-align: center;">Biguanides</p> <ul style="list-style-type: none"> • liquid metformin* (<i>Riomet</i>) • metformin (<i>Glucophage</i>) • metformin extended release (<i>Glucophage XR, Fortamet, Glumetza</i>) <p>* <i>Liquid formulation for patients unable to swallow large tablets</i></p>	<p>Decrease hepatic glucose production, increase GLP-1 secretion.</p>	<p>Low risk for hypoglycemia.</p> <p>Low cost.</p> <p>Well understood side effects</p>	<p>Contraindicated in advanced liver disease, alcohol excess, decompensated CHF, acute intercurrent illness, dehydration</p> <p>Side effects include gas, diarrhea, B12 deficiency, lactic acidosis</p>	<p>Use as initial therapy unless contraindicated.</p> <p>Initiate at low dose, increase dose slowly and take with food to decrease gas, diarrhea.</p> <p>Extended release formulation may decrease GI symptoms.</p> <p>May cause weight loss</p> <p>May cause GI symptoms initially</p>

				<p>or symptoms may develop after prolonged use</p> <p>Measure liver functions, serum creatinine and eGFR initially, then periodically and with any increase in dose.</p> <p>Avoid initiating and stop use if eGFR <45</p>
<p>Insulin secretagogues Sulfonylureas</p> <ul style="list-style-type: none"> • glimepiride (<i>Amaryl</i>) • glipizide (<i>Glucotrol</i>) • glipizide extended release (<i>Glucotrol XL</i>) • glyburide (<i>Micronase, Diabeta</i>) • micronized glyburide (<i>Glynase</i>) <p>Meglitinides</p> <ul style="list-style-type: none"> • repaglinide (<i>Prandin</i>) <p>D-phenylalanine Derivatives</p> <ul style="list-style-type: none"> • nateglinide (<i>Starlix</i>) 	Stimulate beta cell insulin secretion.	<p>Many sulfonylureas are available at lower costs.</p> <p>Shorter acting agents like glipizide, or the non-sulfonylurea insulin secretagogues repaglinide and nateglinide, may lower the risk of nocturnal hypoglycemia. In patients with erratic oral intake these meds may lower the risk of daytime hypoglycemia.</p>	<p>Contraindicated in severe liver or renal disease</p> <p>Risk of hypoglycemia especially with longer acting sulfonylureas such as chlorpropamide (first generation sulfonylurea) and glyburide.</p>	<p>Consider use of short acting sulfonylurea in the setting of renal disease to reduce the risk for hypoglycemia.</p> <p>Repaglinide or nateglinide may be useful for those with postprandial hyperglycemia or with hypoglycemia on sulfonylurea</p> <p>Watch for increased risk of hypoglycemia with acute illness, hospitalization, weight loss, lack of appetite, skipped meals and those with memory issues</p>
<p>Thiazolidinediones (TZDs)</p> <ul style="list-style-type: none"> • pioglitazone (<i>Actos</i>) • rosiglitazone (<i>Avandia</i>) 	Improve glucose transport, and decrease hepatic glucose production.	<p>TZDs can be well tolerated in the healthy older adults as they do not cause hypoglycemia.</p> <p>Can be used in renal impairment but may increase fluid retention.</p>	<p>Fluid retention and CHF are common co-morbidities in the elderly, preventing the use of TZDs</p> <p>Should be avoided in patients with Class III and Class IV congestive heart failure. See footnotes 1, 2, and 3 for CV and other risks.</p> <p>Contraindicated in liver disease.</p> <p>Increases bone loss and risk for bone fracture.</p>	<p>Side effects of fluid retention can be limiting factors in using this class of medications.</p> <p>See footnotes 1,2,3, for CV and other risks</p> <p>Concerns re bladder cancer are less in the elderly with short life expectancy</p>

			May increase risk for macular edema.	
Alpha-Glucosidase Inhibitors <ul style="list-style-type: none"> acarbose (<i>Precose</i>) miglitol (<i>Glyset</i>) 	Delay absorption and breakdown of carbohydrates	<p>Use if postprandial hyperglycemia predominates.</p> <p>Low risk of hypoglycemia if used as monotherapy</p>	<p>Contraindicated in chronic intestinal disorders.</p> <p>May cause gas, diarrhea.</p> <p>Acarbose is contraindicated in cirrhosis.</p> <p>Do not use in renal impairment (creatinine > 2.0)</p>	<p>Modest glucose lowering affect.</p> <p>Ideally use pure glucose to treat hypoglycemia when used in combination therapy as the drugs decrease absorption of other forms of carbohydrate.</p> <p>Initiate at low dose and increase slowly to decrease flatulence</p>
DPP-4 Inhibitors <ul style="list-style-type: none"> sitagliptin (<i>Januvia</i>) saxagliptin (<i>Onglyza</i>) linagliptin (<i>Tradjenta</i>) alogliptin (<i>Nesina</i>) 	In a glucose dependent manner, these medications slow the inactivation of incretin hormones, resulting in increased insulin secretion and decreased glucagon levels	<p>Helpful in controlling post prandial glucose elevations.</p> <p>Lower risk of hypoglycemia.</p>	<p>Side effects include occasional diarrhea and stomach discomfort.</p> <p>Safety of use in the setting of prior pancreatitis is unknown. Stop medication if pancreatitis is suspected when a DPP-4 inhibitor is in use.</p> <p>High cost</p> <p>Lower glucose lowering efficacy may result in the need for a multidrug program</p> <p>Increased risk for CHF with saxagliptin</p>	<p>Low risk of hypoglycemia</p> <p>Assess kidney function prior to initiating and periodically thereafter.</p> <p>Reduce dose in renal disease with some members of the class.</p> <p>Good drug for frail elderly, with newly diagnosed DM</p> <p>Post marketing reports of hepatic failure with alogliptin.</p>

<p>SGLT-2</p> <ul style="list-style-type: none"> • canagliflozin (Invokana) • dapagliflozin (Farxiga) • empagliflozin (Jardiance) 	<p>Blocks the reabsorption of glucose by the proximal tubule of the kidney thereby increasing excretion of glucose in the urine.</p>	<p>Low risk of hypoglycemia</p>	<p>Do not use in moderate to severe renal disease as it may worsen renal function.</p> <p>May reduce blood pressure.</p> <p>There is an increased risk for genital mycotic infections and for UTI</p> <p>May result in dehydration, weight loss, hyperkalemia, increased LDL cholesterol.</p> <p>High cost</p> <p>Little data available for safety in the older population</p>	<p>Adjust dose in mild kidney disease.</p> <p>To decrease the risk of hypotension and dehydration, consider antihypertensive medication adjustment especially diuretics when starting this med class.</p> <p>Do not use dapagliflozin in setting of bladder cancer, use with caution with a history of bladder cancer</p>
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Many of the oral diabetes medications are available in fixed combinations. Please see Joslin's *Clinical Guideline for Pharmacological Management of Adults with Type 2 Diabetes*. Fixed combinations have the advantage of one vs two co-payments. Adherence may improve as there are fewer tablets to administer and to remember. The disadvantage to fixed combinations is decreased flexibility in dosing

Colesevelam, a bile acid sequestrant, and quick-release bromocriptine are approved by the FDA for the treatment of diabetes, but there is very limited use in the older population.

INJECTABLE ANTIDIABETIC MEDICATIONS
For additional detail see *Joslin's Pharmacological Guideline*

MEDICATION CLASS	MECHANISM OF ACTION	ADVANTAGES	DISADVANTAGES	CAVEATS in the OLDER POPULATION
<p>INCRETIN MIMETICS</p> <ul style="list-style-type: none"> • exenatide (<i>Byetta</i>) • liraglutide (<i>Victoza</i>) • extended release exenatide (<i>Bydureon</i>) • albiglutide (<i>Tanzeum</i>) • Dulaglutide (<i>Trulicity</i>) 	<p>In a glucose dependent manner increase insulin secretion, decrease glucagon secretion, slow gastric emptying, and increase satiety</p>	<p>Use may be associated with weight loss, this is helpful in the overweight/obese person</p> <p>Low risk of hypoglycemia</p>	<p>These are injectable medications.</p> <p>Dosing frequency is dependent on the medication and can range from twice a day to once weekly.</p> <p>Side effects include nausea,</p>	<p>Low risk of hypoglycemia and formulation that can be used once weekly makes this an attractive agent to use in elderly</p> <p>Consider the person's cognitive abilities, dexterity and visual acuity before considering use of any injectable medication.</p>

			diarrhea and increased satiety, which can affect nutritional status in the older adult. Increased risk for pancreatitis. Risk for acute renal impairment High cost Limited data on safety in the older population	To decrease risk of hypoglycemia if using with a sulfonylurea or basal insulin, consider initially decreasing sulfonylurea or insulin dose.
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INSULIN				
MEDICATION CLASS	MECHANISM OF ACTION	ADVANTAGES	DISADVANTAGES	CAVEATS in the OLDER POPULATION
Injectable U-100 Insulins Rapid acting: <ul style="list-style-type: none"> • Insulin aspart analog (Novolog) • Insulin glulisine analog (Apidra) • Insulin lispro analog (Humalog) Short acting: <ul style="list-style-type: none"> • Human Regular (Humulin R and Novolin R) Intermediate acting: <ul style="list-style-type: none"> • Human NPH insulin (Humulin N and Novolin N) Long acting: <ul style="list-style-type: none"> • Insulin detemir (Levemir) • Insulin glargine (Lantus) Premixed insulins: <ul style="list-style-type: none"> • 70% NPH; 30% Regular 	Allows glucose to enter cells for an energy source, decreases hepatic glucose production	<p>Improved glucose control in type 2 diabetes when used in combination with other antidiabetic medications, or when other programs do not give adequate control. Insulin can be used as monotherapy.</p> <p>Insulin is the only treatment choice in treating type 1 diabetes</p>	<p>Older adult patients taking insulin often face difficulties with self-administration because of reduced dexterity, impaired vision and cognitive deficits.</p> <p>Risk of hypoglycemia</p>	<p>Consider the person's type of diabetes, cognitive abilities, dexterity and visual acuity before considering the use of insulin.</p> <p>Long acting insulin can be used safely with other non-insulin diabetes medications to control post prandial glycemia. When deciding on the timing and dose of basal insulin, consider the individual's glucose pattern. In general, older adults have a higher contribution of postprandial hyperglycemia compared to fasting hyperglycemia. Thus, starting basal insulin in the morning in this population</p>

<p>(Humulin 70/30)</p> <ul style="list-style-type: none"> • 70% NPH; 30% Regular (Novolin 70/30) • 50% lispro protamine suspension, 50% lispro (Humalog Mix 50/50) • 75% lispro protamine suspension, 25% lispro (Humalog Mix 75/25) • 70% aspart protamine suspension, 30% aspart (Novolog Mix 70/30) 				<p>may decrease the risk of nocturnal hypoglycemia and improve postprandial glucose control</p> <p>It is often beneficial to use simpler insulin regimens with fewer daily injections, such as pre-mixed insulin preparations and easier injection systems (e.g., insulin pens with easy to set dosages). If syringe and vial are to be used, a careful assessment of the individual's ability to draw up and give an injection needs to be made prior to devising the insulin and self-monitoring program.</p> <p>The risk for hypoglycemia when using premixed insulins is lessened when meal times are more fixed.</p> <p>There is a potential increased risk for nocturnal hypoglycemia when taking a premixed insulin at the evening meal.</p> <p>Other self-management skills, such as treating hypoglycemia and eating on a regular schedule, will need to be assessed prior to determining the person's insulin program and re-assessed periodically thereafter.</p>
<p>Injectable U-300 Insulin</p>				<p>Limited experience. May be used in patients with large insulin requirement (greater than 200 units daily)</p>

Injectable U-500 Insulin				May be used in patients with large insulin requirement (greater than 200 units daily)
INHALED INSULIN Afrezza inhalation insulin		May be used in place of prandial insulin	Older adult patients taking insulin often face difficulties with self-administration because of reduced dexterity, impaired vision and cognitive deficits. Risk of hypoglycemia Need to ensure normal pulmonary function periodically	Limited experience.

HYPERTENSION GENERAL CONSIDERATIONS

The goals of therapy for hypertension in the older adult are the same as for younger adults with diabetes. The target blood pressure should be less than 140/90 mm/Hg as tolerated. Isolated systolic hypertension is much more common in the older adult. SBP < 150 is acceptable in patients with multiple co-morbidities, or limited life expectancy. Care should be taken to treat with antihypertensive agents to bring systolic blood pressure to goal, if feasible. Blood pressure should be lowered gradually in order to reduce the risk of hypotensive symptoms. Older adults are prone to “white coat” hypertension. If suspected, patients should be asked to measure blood pressure at home and keep a log for periodic evaluation.

ANTI-HYPERTENSIVES				
MEDICATION CLASS	MECHANISM OF ACTION	ADVANTAGES	DISADVANTAGES	CAVEATS in the OLDER POPULATION
ACEI/ARB Examples include the following: ACEI: lisinopril, ramipril, renazepril, trandolapril ARB: losartan, valsartan irbesartan	Inhibition of the Renin-Angiotensin system	-Evidence for cardiovascular benefits -Evidence for renal protection	-Dry cough with ACEI -Hyperkalemia. -Fall in eGFR (contraindicated in renal vascular disease) -Angioneurotic edema with ACEI (rare)	Before initiating therapy, check baseline renal function and serum potassium, recheck within 1 to 2 weeks of initiation of therapy, with each medication dose increase, and at least yearly thereafter.
Diuretics				

Examples include the following: hydrochlorothiazide, chlorthalidone, furosemide, torsemide, bumetinide, indapamide	-Sodium excretion - Limit volume expansion	May be effective as monotherapy; also additive blood pressure lowering effect with other agents.	-Hypokalemia -Volume depletion -Dehydration (dose- related)	Before initiating therapy, check baseline electrolytes, recheck electrolytes within 1 to 2 weeks of initiation of therapy, with each medication dose increase, and at least yearly thereafter.
Calcium Channel Blockers Examples include the following: diltiazem, verapamil, amlodipine	Direct vascular effects by inhibition of calcium channels	Potent anti-hypertensive effect. May have greater effect in stroke prevention.	Fluid retention with certain agents in class (amlodipine, diltiazem) Bradycardia with certain agents in class (diltiazem, verapamil)	There is some evidence to suggest that treatment with calcium channel blockers, diuretics and ACE inhibitors are more effective than beta blockers in this population
Beta Blockers Examples include the following: metoprolol, atenolol, propranolol, carvedilol)	Reduce cardiac output;	Evidence for cardiovascular benefits after acute coronary events.	Bradycardia, fatigue	May be less effective in the older adults, and African Americans.
Mineralocorticoid Receptors Antagonists Examples include the following: spironalactone, eplerenone	Inhibit mineralocorticoid receptor	Additive effects as anti-hypertensives or in heart - failure	Hyperkalemia	Before initiating therapy, check baseline renal function and serum potassium, recheck within 1 to 2 weeks of initiation of therapy, with each medication dose increase, and at least yearly thereafter.
Combination therapy				Most patients require more than one antihypertensive medication to reach goal

LIPIDS (For more detail please see *Joslin's Clinical Guideline for Adults with Diabetes*)

GENERAL CONSIDERATIONS

- **All individuals with pre-existing CVD:** Based on a large body of clinical trial evidence, all individuals with pre-existing CVD should be treated with high - intensity statin therapy designed to lower LDL-C by $\geq 50\%$ from baseline, regardless of baseline cholesterol. The adherence to statin therapy should be monitored at 4-12 weeks after initiation, and every 3-12 months thereafter, as indicated.
 - If age > 75 yr, or if adverse events on high – intensity statin dose, treat with moderate-intensity statin therapy, designed to lower LDL-C by 30- $<50\%$ from baseline. If the baseline LDL-C is not known, the minimum target should be LDL-C < 70 mg/dl, or non- HDL-C < 100 mg/dl.
- **For primary prevention in older people ≤ 75 years of age:** Statin therapy should be based on 10-yr CVD risk calculated by the revised risk-calculator (<http://www.my.americanheart.org/cvriskcalculator>).
 - If the 10-yr risk is $< 7.5\%$, a moderate to intensive statin therapy is indicated, designed to lower LDL-C by 30- $<50\%$ from baseline. If the baseline LDL-C is not known, the minimum target should be **LDL-C < 100 mg/dl, or non- HDL-C < 130 mg/dl.**
 - If the 10 –yr risk is $\geq 7.5\%$, intensive statin therapy should be instituted, designed to lower LDL-C by $\geq 50\%$ from baseline, regardless of baseline cholesterol. If the baseline LDL-C is not known, the minimum target should be LDL-C < 70 mg/dl, or non- HDL-C < 100 mg/dl.
- **For primary prevention in older people > 75 yr of age:** Initiation of statin therapy is of uncertain value, and should be individualized, based on co-morbidities, life- expectancy, safety considerations, and priorities of care. Consider stopping statin if life expectancy is less than 1 year

LIPID LOWERING MEDICATIONS				
MEDICATION CLASS	MECHANISM OF ACTION	ADVANTAGES	DISADVANTAGES	CAVEATS
HMG Co-R Reductase Inhibitors (Statins) <ul style="list-style-type: none"> • atorvastatin (<i>Lipitor</i>) • fluvastatin (<i>Lescol</i>) • lovastatin (<i>Altoprev, Mevacor</i>) • pitavastatin (<i>Livalo</i>) • pravastatin (<i>Pravachol</i>) • rosuvastatin (<i>Crestor</i>) • simvastatin (<i>Zocor</i>) 	Reduce cholesterol synthesis and promote cholesterol excretion by enhancing the activity of LDL receptors.	<p>Drug class of choice for lowering LDL-C on the basis of many clinical trials.</p> <p>Reduce LDL-C ~20-60%, depending on drug and dose.</p> <p>Reduce CVD events in both primary prevention and in patients with pre- existing CVD.</p>	<p>3-6% probability of liver toxicity; 10-15 % probability of myalgia or muscle weakness; rarely myositis or rhabdomyolysis.</p> <p>May precipitate new-onset diabetes, especially in those with pre- diabetes or metabolic syndrome</p> <p>Rarely result in GI adverse effects,</p> <p>Rarely result in cognitive disturbances (reversible).</p>	<p>Check ALT within 4-12 weeks of initiation of the medication, with each dose increase, and with any signs or symptoms of liver dysfunction.</p> <p>Routine CK measurements are not necessary unless symptoms warrant.</p> <p>Older adults on medications for hyperlipidemia should have periodic evaluation of liver enzymes.</p>

Ezetimibe	Reduces cholesterol absorption	Well- tolerated Additive efficacy in lowering LDL-C, beyond statin effects.	Modest effect – lowers LDL-C by 15-20 % Rare side- effects.	May improve CVD event reduction, when added to moderate dose statin ,if statin intensification not feasible Not preferred in monotherapy, but may be useful as adjunct to statin, if statin alone cannot be intensified.
Bile acid sequestrants	Bind to bile acids and promote excretion of cholesterol in gut.	Dose dependent reduction in LDL-C, 15-30 %. Can be combined with statins.	Adherence issues due to GI Side- effects	Limited data on CVD event reduction. Not preferred in monotherapy unless other agents can't be used.
Niacin	Inhibits lipolysis, and multiple lipid effects via diverse mechanisms.	Dose – dependent lowering of LDL-C by 10-20 %, raises HDL-C by 15-25%, and lowers TG, 15-30 % Additive efficacy with statins in achieving lipid goals.	Adherence issues due to multiple adverse effects, including flushing, pruritus, liver toxicity, hyperuricemia, and raised glucose levels.	Effects on CVD prevention unproven.
Fibrates	Inhibit lipolysis and VLDL production; enhance triglyceride clearance.	Drug of choice to lower triglycerides; raise HDL-C, minimal effects on LDL-C.	Myalgia in combination with other drugs, including statins Caution in presence of CKD; may promote gallstones	Limited data on CVD event reduction. Indicated in preventing pancreatitis, if TG > 500 mg/dl Additional studies on CVD events underway
Omega- 3 fatty acids	Inhibit triglyceride synthesis in liver.	Well tolerated. 25-30 % reduction in triglyceride levels, modest effects on HDL-C, may raise LDL-C	Adherence issues May prolong bleeding time.	No data on CVD event reduction- studies on-going. Currently approved to lower triglycerides if > 500 mg/dl; may reduce risk of pancreatitis.

FOOT CARE

- Recommendations for foot examinations and treatment in older adults with diabetes are the same as those for younger individuals. Older adults may require additional education and devices such as mirrors to examine their feet due to decreased mobility and dexterity. See **Joslin's Clinical Guideline for Adults with Diabetes** for more detail.
- Older adults should be encouraged to see a podiatrist regularly. Medicare provides coverage for podiatrist visits every 9 weeks, along with special footwear for patients with diabetes-related foot problems.

EYE CARE

Recommendations for eye examinations and treatment in older adults with diabetes are the same as those recommended in Joslin's *Clinical Guideline for Adults with Diabetes*.

- Providers should also consider eye conditions commonly seen in older adults, including glaucoma, macular degeneration and cataracts, which may be present without evidence of diabetic eye disease or coincident with diabetic eye disease.
 - Nondiabetic ocular complications such as cataract may complicate evaluation and treatment of diabetic retinopathy
 - Interventions for nondiabetic ocular conditions may be risk factors for progression of diabetic retinopathy
 - Interventions for diabetic eye disease may pose risk factors for progression of nondiabetic eye conditions such as cataract and glaucoma
- Although tighter glycemic control has been shown to lower the risk of eye complications, the overall risk of hypoglycemia and increased mortality risk with tight control in the older population should be considered when setting the glycemic goals.

FOOT NOTES

¹There is an increased risk for edema when insulin and a thiazolidinedione are used together. Rosiglitazone should not be used in combination with insulin.

²**FDA Requirements for LFT monitoring for thiazolidinediones (TZDs):**

If initial ALT is > 2.5 times normal, do not start this medication

Once TZD is started, monitor ALT periodically thereafter according to clinical judgement.

If ALT is > 2.5 times normal during treatment, check weekly. If rise persists or becomes 3 times > normal, discontinue TZD.

³Thiazolidinediones cause or exacerbate congestive heart failure in some patients. After initiation of TZDs and after dose increases, observe patients carefully for signs and symptoms of heart failure (including excessive, rapid weight gain, dyspnea, and/or edema). If these signs and symptoms develop, the heart failure should be managed according to current standards of care. Furthermore, discontinuation or dose reduction of the TZD must be considered. TZDs are not recommended in patients with symptomatic heart failure or in patients with established NYHA Class III or IV heart failure.

³ⁱ On September 23, 2010, the Food and Drug Administration (FDA) announced regulatory actions with respect to products containing rosiglitazone: Avandia® (rosiglitazone maleate) Tablets, Avandamet® (rosiglitazone maleate and metformin hydrochloride) Tablets and Avandaryl® (rosiglitazone maleate and glimepiride) Tablets. These FDA actions required GlaxoSmithKline (GSK) to implement restrictions on the use of these products through a REMS program (Risk Evaluation and Mitigation Strategy) to assure their safe use and through additional safety labeling changes in response to the agency's review of data that suggested an elevated risk of cardiovascular events. However, based on additional data review, the REMS program was removed as of May 2014. Rosiglitazone now has the same indications for prescribing as pioglitazone.

³ⁱⁱ According to FDA advisory issued on June 15, 2011 re: potentially increased risk of bladder cancer with Pioglitazone use: a. Do not use pioglitazone in patients with active bladder cancer. b. Use pioglitazone with caution in patients with a prior history of bladder cancer. The benefits of glycemic control versus unknown risks for cancer recurrence with pioglitazone should be considered in patients with a prior history of bladder cancer

Glossary

<p>A1C: hemoglobin A1C; glycosylated hemoglobin ACE inhibitors: angiotensin converting enzyme inhibitors ADL: Activities of Daily Living ALT: alanine aminotransferase ARBs: angiotensin receptor blockers CHF: congestive heart failure CK: creatinine kinase CV: cardiovascular disease CVD: cardiovascular disease DBP: diastolic blood pressure DPP-4 inhibitors: dipeptidyl peptidase inhibitors eGFR: estimated glomerular filtration rate HDL-C: high density lipoprotein</p>	<p>IADL: Instrumental Activities of Daily Living LFTs: liver function tests LDL-C: low density lipoprotein mg/dl: milligrams per deciliter MINI-COG: Mini cognitive test mmHg: millimeters of mercury MoCA: Montreal Cognitive Assessment Test NPH: neutral protamine hagedorn PHQ-2: Patient Health Questionnaire SBP: systolic blood pressure SMBG: self-monitoring of blood glucose SGLT2: sodium glucose cotransporter -2 TZDs: thiazolidinediones</p>
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Grading System Used in Guideline

Evidence graded less than “A” is acceptable to support clinical recommendations in a guideline. It is also assumed that for many important clinical recommendations, it would be unlikely that level A evidence be obtained because appropriate studies may never be performed.

¹Guyatt G et al. Grading strength of recommendations and quality of evidence in clinical guidelines: Report from an American College of Physicians Task Force. Chest 129:174-181, 2006

Grade of Recommendation	Clarity of risk/benefit	Quality of supporting evidence
1A Strong recommendation High quality of evidence	Benefits clearly outweigh risk and vice versa.	Consistent evidence from well performed randomized, controlled trials or overwhelming evidence of some other form. Further research is unlikely to change our confidence in the estimate of benefit and risk.
1B Strong recommendation Moderate quality of evidence	Benefits clearly outweigh risk and burdens, or vice versa.	Evidence from randomized, controlled trials with important limitations (inconsistent results, methodological flaws, indirect or imprecise), or very strong evidence of some other research design. Further research is likely to have an impact on our confidence in the estimate of the benefit and risk and may change the estimate.
1C Strong recommendation Low quality of evidence	Benefits outweigh risk and burdens, or vice versa.	Evidence from observational studies, unsystematic clinical experience, or from randomized controlled trials with serious flaws. Any estimate of effect is uncertain.
2A Weak recommendation High quality of evidence	Benefits closely balanced with risks and burdens.	Consistent evidence from well performed randomized controlled trials or overwhelming evidence of some other form. Further research is unlikely to change our confidence in the estimate of benefit and risk.
2B Weak recommendation Moderate quality of evidence	Benefits closely balanced with risks and burdens; some uncertainty in the estimates of benefits, risks and burdens.	Evidence from randomized controlled trials with important limitations (inconsistent results, methodological flaws, indirect or imprecise), or very strong evidence of some other research design. Further research is likely to have an impact on our confidence in the estimate of benefit and risk and may change the estimate.
2C Weak recommendation Low quality of evidence	Uncertainty in the estimates of benefits, risks and burdens; benefits may be closely balanced with risks and burdens.	Evidence from observational studies, unsystematic clinical experience, or from randomized controlled trials with serious flaws. Any estimate of effect is uncertain.

References:

1. ADA: Standards of medical care in diabetes 2015 Diabetes Care 2015 38(Suppl 1):S 67-69
2. Christmas, C, Andersen, RA. Exercise and older patients: Guidelines for the clinician. J Am Geriatr Soc 48:318-24, 2000.
3. Collins R, Armitage J. High-risk elderly patients PROSPER from cholesterol lowering therapy. Lancet 2002;360: 1618–1619
4. Ganda, OP. Deciphering cholesterol treatment guidelines. A clinician's perspective. JAMA 2015; 313: 1009-1010
5. Cannon CP, Blazing MA, Giugliano RP, et al. Ezetimibe added to statin therapy after acute coronary syndromes. N Engl J Med 2015;372:2387-2397
6. D'Ath, P et al. Screening, detection and management of depression in elderly primary care attenders. I: The acceptability and performance of the 15 item Geriatric Depression Scale (GDS15) and the development of short versions. Fam Pract 11: 260-6, 1994.
7. Ekblom T et al. Cardiovascular events in elderly patients with isolated systolic hypertension. A subgroup analysis of treatment strategies in STOP-Hypertension-2. Blood Press 13:137-41, 2004.
8. Folstein, MF, Folstein, SE, McHugh, PR. "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res 12:189-98, 1975.
9. Geller, A.I., et al., National Estimates of Insulin-Related Hypoglycemia and Errors Leading to Emergency Department Visits and Hospitalizations. JAMA Intern Med, 2014.
10. IDF Managing older people with diabetes. IDF Global Guidelines 2013 ISBN 2-930229-86-1.
11. James PA, Oparil S, Carter BL, et al 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults: Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8). JAMA. 2014; 311:507-520
12. Katz, S., et al., Studies of Illness in the Aged. The Index of Adl: A Standardized Measure of Biological and Psychosocial Function. Jama, 1963. 185: p. 914-9.
13. Kirkman, M.S., et al., Diabetes in older adults. Diabetes Care, 2012. 35(12): p. 2650-64.
14. Laiteerapong N, Karter AJ, Liu JY, et al. Correlates of quality of life in older adults with diabetes: the Diabetes & Aging Study. Diabetes Care 2011;34:1749–1753
15. Lawton, M.P. and E.M. Brody, Assessment of older people: self-maintaining and instrumental activities of daily living. Gerontologist, 1969. 9(3): p. 179-86
16. Lipska, MJ et al Potential Overtreatment of Diabetes Mellitus in Older Adults With Tight Glycemic Control JAMA Intern Med. 2014 doi:10.1001/jamainternmed.2014.7345.
17. Malloy, PF et al. Cognitive screening instruments in neuropsychiatry: a report of the Committee on Research of the American Neuropsychiatric Association. J Neuropsychiatry Clin Neurosci 9:189-97, 1997.
18. Morgan TO, Anderson AI, MacInnis RJ. ACE inhibitors, beta blockers, calcium blockers, and diuretics for the control of systolic hypertension. Am J Hypertens 14:241-7, 2001.
19. Munshi, M.N., et al., Frequent hypoglycemia among elderly patients with poor glycemic control. Arch Intern Med, 2011. 171(4): p. 362-4.
20. Munshi, M., Managing the "geriatric syndrome" in patients with type 2 diabetes. Consult Pharm, 2008. 23 Suppl B: p. 12-6.
21. Munshi, M.N., et al., Assessment of barriers to improve diabetes management in older adults: a randomized controlled study. Diabetes Care, 2013. 36(3): p. 543-9.
22. Munshi MN, Pandya N, Guillermo UE, DeGenio A, Zhou R, Riddle MC: Different contribution of basal and prandial hyperglycemia to total hyperglycemia in older and younger patients with type 2 diabetes. In press, Journal of the American Geriatrics Society 2013; 61(4):535-41: PMID:23581911.
23. Munshi MN, Hayes M, Sternthal A, Ayres D. Use of serum c-peptide level to simplify diabetes treatment regimens in older adults. Am J Med. 2009;122(4):395-7: PMID:19332236

24. Nasreddine, Z.S., et al., The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. *J Am Geriatr Soc*, 2005. 53(4): p. 695-9.
25. Nishiwaki, Y et al. Validity of the Clock-Drawing Test as a screening tool for cognitive impairment in the elderly. *Am J Epidemiol* 160:797-807, 2004.
26. Papademetriou V et al. Stroke prevention with the angiotensin II ty pe 1-receptor blocker candesartan in elderly patients with isolated systolic hypertension: The Study on Cognition and Prognosis in the Elderly (SCOPE). *J Am Coll Cardiol* 44:1175-80, 2004.
27. Shulman, KI. Clock-drawing: is it the ideal cognitive screening test? *Int J Geriatr Psychiatry* 15:548-61, 2000.
28. Sinclair AJ, Paolisso G, Castro M, Bourdel-Marchasson I, Gadsby R, Rodriguez, Mañas L; European Diabetes Working Party for Older People. European Diabetes Working Party for Older People 2011 clinical guidelines for type 2 diabetes mellitus. Executive summary. *Diabetes Metab* 2011;37(Suppl. 3):S27–S38.
29. Stokes GS. Treatment of isolated systolic hypertension. *Curr Hypertens Rep* 8:377-83, 2006.
30. Stone NJ, Robinson J, Lichtenstein AH, et al. ACC/AHA guideline on the treatment of blood cholesterol to reduce atherosclerotic cardiovascular risk in adults: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation*. 2013 Nov. 12; (E pub ahead of print)
31. Thorpe, CT et al Tight Glycemic Control and Use of Hypoglycemic Medications in Older Veterans With Type 2 Diabetes and Comorbid Dementia *Diabetes Care* 2015; 38: 588-595.
32. Tinetti, M.E., Performance-oriented assessment of mobility problems in elderly patients. *J Am Geriatr Soc*, 1986. 34(2): p. 119-26.
33. Tinetti, M.E., T.F. Williams, and R. Mayewski, Fall risk index for elderly patients based on number of chronic disabilities. *Am J Med*, 1986. 80(3): p. 429-34.
34. Tseng, C-L et al Assessing Potential Glycemic Overtreatment in Persons at Hypoglycemic Risk. *JAMA Int Med* 2014; 174: 259-268.
35. Zammitt N, Frier B. Pathophysiology, frequency, and effects of different treatment modalities. *Diabetes Care* 28:2948-61, 2005.

Appendix

Example of Exercise Prescriptions	
<p>For inactive or frail patients</p> <p>Do the items checked below. If an item is not checked, ignore it.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Walk 5 minutes inside the house or in the hallway, every day <ul style="list-style-type: none"> <input type="radio"/> Start with 1-3 times a day before meal <input type="radio"/> Increase a little each week to 10 minutes 3 times every day <input type="checkbox"/> Pedal with legs and arm <ul style="list-style-type: none"> <input type="radio"/> Start with what you can do and increase a little each week up to 15-20 minutes every day <input type="checkbox"/> Stationary bike <ul style="list-style-type: none"> <input type="radio"/> Start with 5 minutes, 1-3 times a day <input type="radio"/> Increase a little each week up to 30 minutes every day 	<p>For active patients</p> <p>Do the items checked below. If an item is not checked, ignore it.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Aerobic activity: Do one of these at least 5 days each week. You can do the same one each time or pick a different one for variety. Start with short periods of time and increase to 30-60 minutes a day. <ul style="list-style-type: none"> <input type="radio"/> Walking (use pedometer to increase activity as tolerated) <input type="radio"/> Stationary bike <input type="radio"/> Swimming <input type="radio"/> Water aerobics <input type="checkbox"/> Resistive training: Do one of these at least 2 days each week. You can do the same one each time or pick a different one for variety. Start with no/low weights and increase weights and repetitions as tolerated up to 8-10reps for 2-3 cycles for each muscle group <ul style="list-style-type: none"> <input type="radio"/> Hand weights (or 8oz water bottle) <input type="radio"/> Resistance bands <input type="radio"/> Use machines at gym <input type="checkbox"/> Stretching Do one of these daily. You can do the same one each time or pick a different one for variety. Again, start low and go slow. Avoid excessive stretching and injury. <ul style="list-style-type: none"> <input type="radio"/> Yoga <input type="radio"/> Stretching

Example of Nutrition Prescriptions	
<p>To avoid low blood sugar</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not skip or delay meals <input type="checkbox"/> Have some carbohydrate/starch to eat at each meal <input type="checkbox"/> Keep glucose tablets/gel or hard candy with you at all times <input type="checkbox"/> Check your blood sugar anytime you feel unwell, sick or confused <input type="checkbox"/> Eat a snack before any significant activity 	<p>Nutrition Prescriptions</p> <p>Do the items checked below. If an item is not checked, ignore it.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not skip or delay meals <input type="checkbox"/> Have some carbohydrate/starch to eat at each meal <input type="checkbox"/> Have at least 1500mg of calcium and 800 units of vitamin D every day <input type="checkbox"/> Eat a snack at bedtime <input type="checkbox"/> Eat a snack between meals <input type="checkbox"/> Eat a snack before any physical activity

DETERMINE Nutritional Assessment		
For each statement, circle the response in the YES/NO column that applies to you		
I have an illness or condition that made me change the kind and/or amount of food I eat.	YES	NO
I eat fewer than 2 meals per day.	YES	NO
I eat few fruits or vegetables, or milk products (less than 3 fruits/vegetables, 2 dairy)	YES	NO
I have 3 or more drinks of beer, liquor or wine almost every day.	YES	NO
I have tooth or mouth problems that make it hard for me to eat.	YES	NO
I don't always have enough money to buy the food I need.	YES	NO
I eat alone most of the time.	YES	NO
I take 3 or more different prescribed or over-the-counter drugs a day	YES	NO
Without wanting to, I have lost or gained 10 pounds in the last 6 months	YES	NO
I am not always physically able to shop, cook, and or feed myself.	YES	NO

Basic Activities of Daily Living

- **Bathing:** includes grooming activities such as shaving, and brushing teeth and hair
- **Dressing:** choosing appropriate garments and being able to dress and undress, having no trouble with buttons, zippers or other fasteners
- **Eating:** being able to feed oneself
- **Transferring:** being able to walk, or, if not ambulatory, being able to transfer oneself from bed to wheelchair and back
- **Continence:** being able to control one's bowels and bladder, or manage one's incontinence independently
- **Toileting:** being able to use the toilet

Instrumental Activities of Daily Living

- **Using the telephone:** being able to dial numbers, look up numbers, etc.
- **Managing medications:** taking the appropriate medications and correct dosages on time
- **Preparing meals:** making appropriate food choices and preparing meals safely
- **Maintaining the home:** doing or arranging for housekeeping and laundry
- **Managing finances:** budgeting, paying mortgage/rent and bills on time, etc.
- **Shopping:** being able to shop for groceries and other small necessities, and transport purchases from store to home
- **Using transportation:** being able to drive or use public transportation for appointments, shopping, etc.

Depression Screening

Over the past 2 weeks, how often have you been bothered by any of the following problems?

- a. Little or no interest or pleasure in doing things
 - 0: not at all
 - 1: several days
 - 2: more than half the days
 - 3: nearly everyday

- b. Feeling down, depressed, or hopeless
 - 0: not at all
 - 1: several days
 - 2: more than half the days
 - 3: nearly everyday

Total Score (Add a. and b.): _____

(If patient scores > 0, administer full Geriatric Depression Scale)