Strategies to Improve Care in Older Adults with Diabetes
An Integrated Approach with Deprescribing

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Disclosures

- Consultant: Sanofi

Objectives

- Why do we need to consider “deprescribing” in older adults with diabetes?
- What are the barriers to ”de-prescribing”- specifically in diabetes management ?
- Strategies for deprescribing medications in older adults with diabetes

Case: Ms. RW

- 83-year-old independently living Russian-speaking patient
- Type 2 diabetes for 20 years
- A1C during clinic visit: 8.9%
- Only performs fasting glucose: 120-160 mg/dl
- Current regimen
  - Basal insulin 30 u bid, meal-time insulin 10 u bid
  - Metformin 1000 mg bid
  - Sitagliptin 100 mg q day

Do we deprescribe? How?

Why Deprescribing is needed?

ADA: Standards of Care

Diabetes in Older Adults

Table 13.1—Framework for considering treatment goals for glycemia, blood pressure, and dyslipidemia in older adults with diabetes

Patient characteristics/ health status	Rationale	Reasonable A1C goal‡	Fasting or preprandial glucose	Bedtime glucose	Blood pressure	Lipids
Healthy (few coexisting chronic illnesses, intact cognitive and functional status)	Longer remaining life expectancy	<7.0–7.5% (53–58 mmol/mol)	80–130 mg/dL (4.4–7.2 mmol/L)	80–180 mg/dL (4.4–10.0 mmol/L)	<130/80 mmHg	Statin, unless contraindicated or not tolerated
Complex/intermediate (multiple coexisting chronic illnesses* or two or more instrumental ADL impairments or mild-to-moderate cognitive impairment)	Intermediate remaining life expectancy, high treatment burden, hypoglycemia vulnerability, fall risk	<8.0% (64 mmol/mol)	90–150 mg/dL (5.0–8.3 mmol/L)	100–180 mg/dL (5.6–10.0 mmol/L)	<130/80 mmHg	Statin, unless contraindicated or not tolerated
Very complex/poor health (LTC or end-stage chronic illnesses** or moderate-to-severe cognitive impairment or two or more ADL impairments)	Limited remaining life expectancy makes benefit uncertain	Avoid reliance on A1C; glucose control decisions should be based on avoiding hypoglycemia and symptomatic hyperglycemia	100–180 mg/dL (5.6–10.0 mmol/L)	110–200 mg/dL (6.1–11.1 mmol/L)	<140/90 mmHg	Consider likelihood of benefit with statin

Diabetes care 2023; 46; supp 1; S216-29

Guidance from national and International organizations

Patient subgroups	Recommended targets for glycaemia and treatment considerations	Recommended target lipid levels and treatment considerations	Recommended blood pressure targets and treatment considerations
AACE guidelines[140]			
Without concurrent serious illness and with a low risk of hypoglycaemia	HbA_{1c} <6.5% (48 mmol/mol)	Achieve LDL-C thresholds according to the following patient levels of cardiovascular risk: excessive risk <55 mg/dl; very high risk <70 mg/dl; high risk <100 mg/dl; moderate risk <100 mg/dl; low risk <130 mg/dl	<130/80 mmHg
With concurrent serious illness and a high risk of hypoglycaemia	HbA_{1c} >6.5% (48 mmol/mol)		
ADA guidelines[14]			
Healthy: few coexisting chronic illnesses, intact cognitive and functional status	HbA_{1c} <7.5% (58 mmol/mol); fasting glucose 90–130 mg/dl (5.0–7.2 mmol/l); bedtime glucose 90–150 mg/dl (5.0–8.3 mmol/l)	Offer statin treatment unless contraindicated	<140/90 mmHg
Complex or intermediate: multiple coexisting chronic illnesses or 2+ instrumental ADL impairments or mild-to-moderate cognitive impairment	HbA_{1c} <8% (64 mmol/mol); fasting glucose 90–150 mg/dl (5.0–8.3 mmol/l); bedtime glucose 100–180 mg/dl (5.6–10 mmol/l)	Offer statin treatment unless contraindicated	<140/90 mmHg
Very complex or poor health: long-term care or end-stage chronic illness or moderate-to-severe cognitive impairment or 2+ ADL dependencies	HbA_{1c} <8.5% (69 mmol/mol); fasting glucose 100–180 mg/dl (5.6–10.0 mmol/l); bedtime glucose 110–200 mg/dl (6.1–11.1 mmol/l)	Consider statin treatment in those with established cardiovascular disease	<150/90 mmHg
IDF guidelines[6]			
Category 1: functionally independent	HbA_{1c} 7–7.5% (53–58 mmol/mol)	LDL-C <80 mg/dl	<140/90 mmHg
Category 2: functionally dependent	HbA_{1c} 7–8% (53–64 mmol/mol)	Considering relaxation of targets	<150/90 mmHg
Frailty	HbA_{1c} up to 8.5% (69 mmol/mol)	Considering relaxation of targets	<140/90 mmHg
Dementia	HbA_{1c} up to 8.5% (69 mmol/mol)	Considering relaxation of targets	Assess individual circumstances and consider withdrawing treatment
Category 3: end of life	Avoid symptomatic hyperglycaemia	Treatment not necessary	Assess individual circumstances and consider withdrawing treatment
EDWPOP guidelines[138]			
No comorbidities or single system disease	HbA_{1c} 7–7.5% (53–58 mmol/mol)	Primary prevention (those with no previous CVD): offer statin therapy for those with 10-year CVD risk ≥15%. Secondary prevention (those with established CVD): offer statin therapy as first-line and consider adding fibrate therapy if triglyceride levels are elevated after 6 months of statin treatment	140–145/90 mmHg
Frail	HbA_{1c} 7.6–8.5% (60–69 mmol/mol) or fasting blood glucose 137–162 mg/dl (7.6–9.0 mmol)		150/90 mmHg
Endocrine Society guidelines[137]			
Good health: no comorbidities or 1–2 non-diabetes chronic illnesses and no ADL impairments and <1 IADL impairment	Fasting glucose 90–130 mg/dl (5.0–7.2 mmol); bedtime glucose 90–150 mg/dl (5.0–7.2 mmol); HbA_{1c} 7.0–7.5% (53–58 mmol/mol)	Offer statin treatment and annual lipid profile; relaxed goals in those aged >80 years	140/90 mmHg; lower target (130/80 mmHg) in those with previous stroke or progressive chronic kidney disease
Intermediate health: 3 or more non-diabetes chronic illnesses and/or any one of the following: mild cognitive impairment or early dementia and/or >2 IADL impairments	Fasting glucose: 90–150 mg/dl (5.0–7.2 mmol); bedtime glucose: 100–180 mg/dl (5.6–10.0 mmol); HbA_{1c} <8% (64 mmol/mol)		140/90 mmHg; lower target (130/80 mmHg) in those with previous stroke or progressive chronic kidney disease
Poor health: any one of the following: end-stage medical condition; moderate-to-severe dementia; >2 ADL impairments; residence in a long-term nursing facility	Fasting glucose 100–180 mg/dl (5.6–10.0 mmol); bedtime glucose 110–200 mg/dl (6.1–11.1 mmol); HbA_{1c} <8.5% (69 mmol/mol)		145–160/90 mmHg

Bellary s et al;Nat Rev End; 2021; sept 17(9);534-48

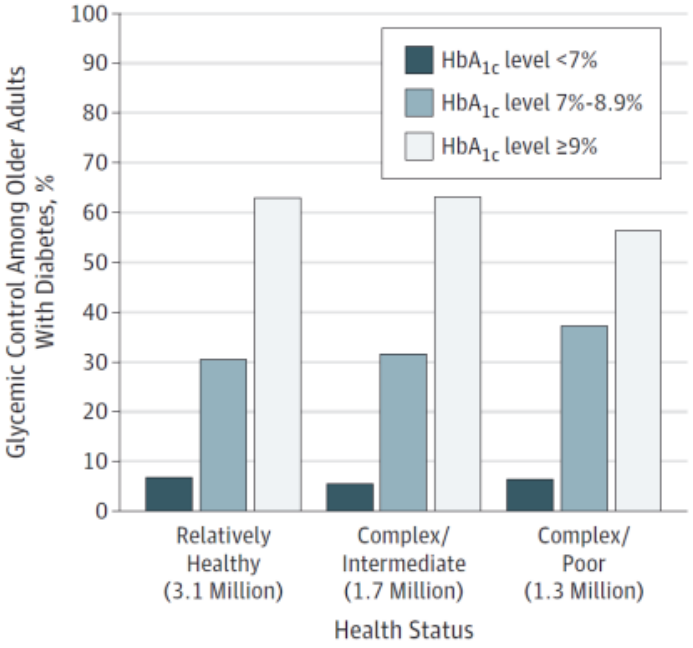
2019 AGS Beers Criteria

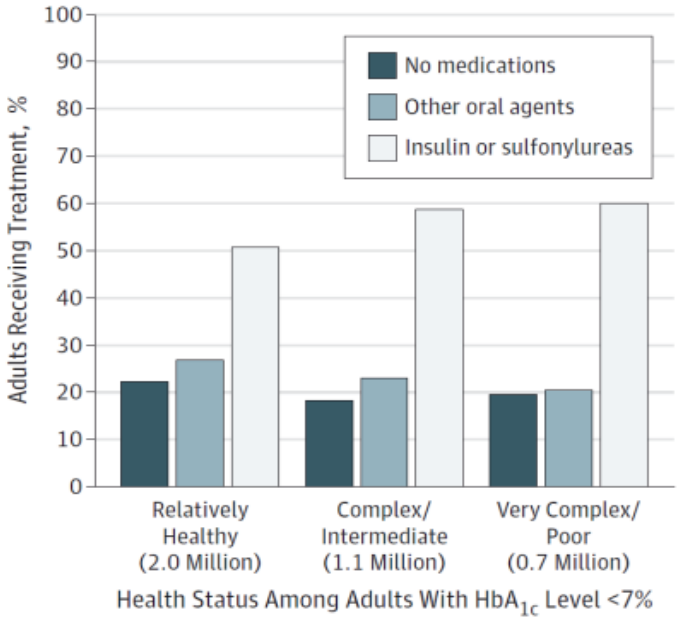
Potentially Inappropriate Medication Use in Older Adults

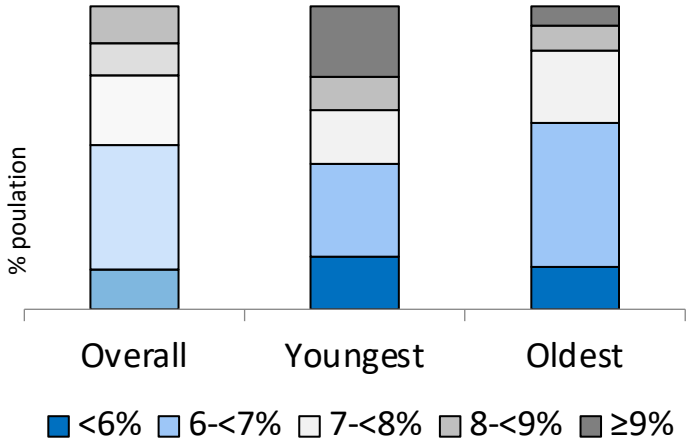
Drug	Rationale	Recommendation	Quality of Evidence	Strength of Recommendation
Thiazolidinediones (pioglitazone, rosiglitazone)	Use with caution in patients with heart failure who are asymptomatic; avoid in patients with symptomatic heart failure	Avoid	High	Strong
Sulfonylureas, long duration Chlorpropamide Glimepiride Glyburide	Chlorpropamide: prolonged half-life in older adults; can cause prolonged hypoglycemia; causes SIADH Glimepiride and Glyburide: higher risk of severe prolonged hypoglycemia in older adults	Avoid	High	Strong

J Am Geriatrics Soc. 2019 67 (4): 674–694

Real-world data shows different picture







Lipska KJ et al; JAMA internal medicine: Jan 2015
Lipska KJ et al: Diabetes Care 2017

National Estimates of Medications Implicated in Emergency Hospitalizations

Older US adults: 2007-2009

Medication	Annual National Estimate of Hospitalizations (N=99,628)		Proportion of Emergency Department Visits Resulting in Hospitalization
	no.	*% (95% CI)*	%
Most commonly implicated medications†			
Warfarin	33,171	33.3 (28.0–38.5)	46.2
Insulins	13,854	13.9 (9.8–18.0)	40.6
Oral antiplatelet agents	13,263‡	13.3 (7.5–19.1)	41.5
Oral hypoglycemic agents	10,656	10.7 (8.1–13.3)	51.8
Opioid analgesics	4,778	4.8 (3.5–6.1)	32.4

Budnitz DS et al; N Engl J Med 2011; 365;2002-12

Severe Hypoglycemia by Report Associated with 3.4 Fold Higher 5-year Mortality

	OR	95% CI	*P* value
Age	1.047	1.027–1.066	<0.001
Male sex	1.716	1.135–2.596	0.011
Type 1 diabetes	0.836	0.410–1.706	0.623
Diabetes duration	1.006	0.985–1.027	0.595
HbA_{1c}	1.127	0.965–1.316	0.131
CCI	1.437	1.323–1.561	<0.001
Hypoglycemia			
Mild	1.564	0.986–2.481	0.468
Severe	3.381	1.547–7.388	0.005

McCoy RG et al; Diabetes Care 2012: 35: 1897-1901

What are the barriers?

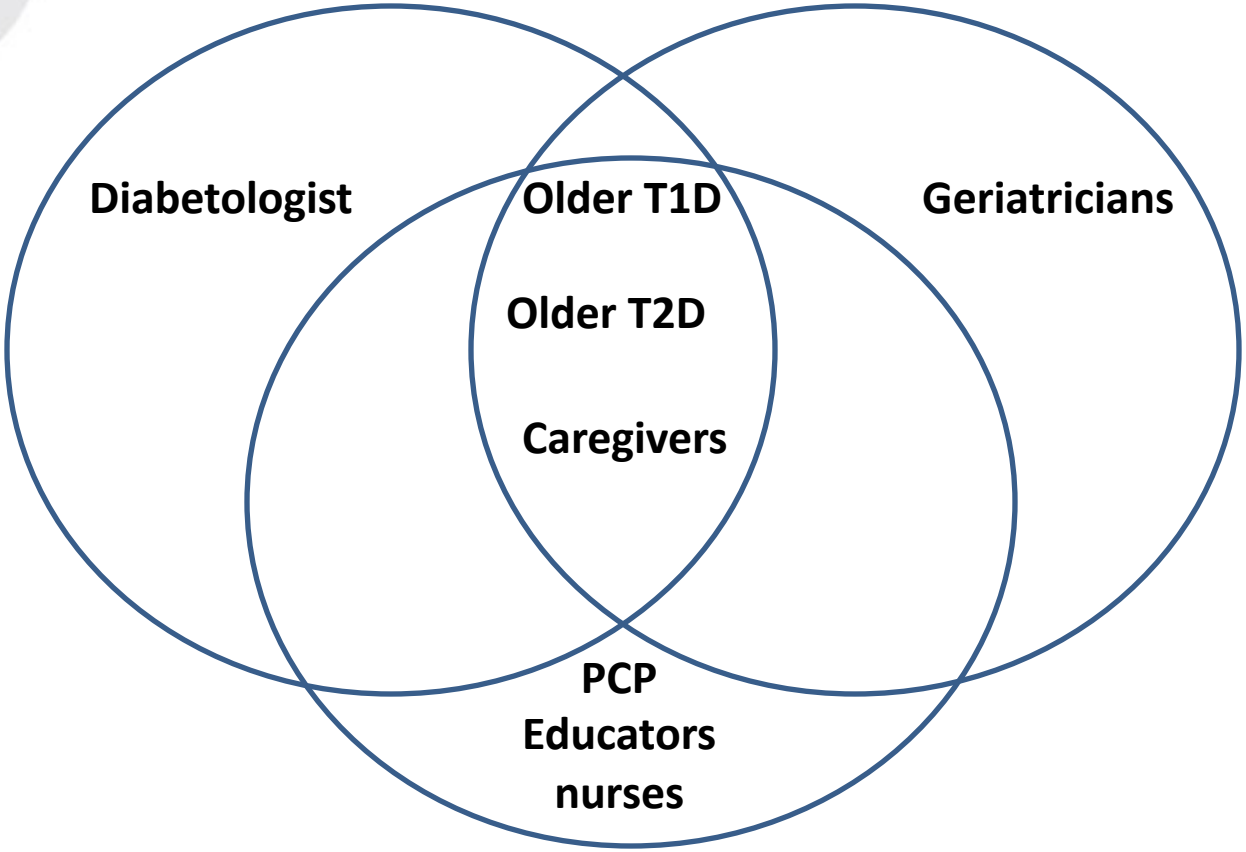
- Different clinicians have different understanding of what deprescribing means
- Deprescribing all medications are not the same
  - Narcotics, benzodiazepines, antipsychotics need different approach then diabetes meds
- Difficulty with parameters for glycemic goal: Fallibility of A1c

Some excerpts from discussion by endocrinologist re: liberalized goals

- Worries about evidence
  - "Where is there data to support A1C < 8.5 is superior to A1C < 7 for "most" people?"
- Worry about withholding beneficial intervention

  "Individualized approach to management is absolutely fine, but withholding therapy in those with excellent control Is a terrible idea"
- Worry about inertia
  - "Putting the individualization, does not equal "most""
  - "It is always interesting that when I see physicians with diabetes, they want their control to be perfect and have HbA1c around 6% or lower"
  - "The ACP and many PCPs who cannot achieve these goals have decided to change goals"
  - "Easily be used to justify PCP inertia and/or drug cost containment by healthcare systems"

Different Views From Different Stakeholders



“Deprescribing”

What it is not

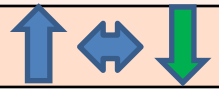
- Giving up
- Putting out to pasture
- Dropping the axe at 65
- Taking away useful tools
- Hospice care
- Treating all older people like they are unable to do anything intelligent

"Deprescribing"

- **Also not**
  - Letting A1C go higher
  - Letting % duration "time-in-range" lower
  - Taking patient off insulin and sulfonylurea
  - Withholding all technologies
  - Decreasing the doses or stopping of diabetes medications (unlike narcotics, antipsychotics, or benzodiazepines)

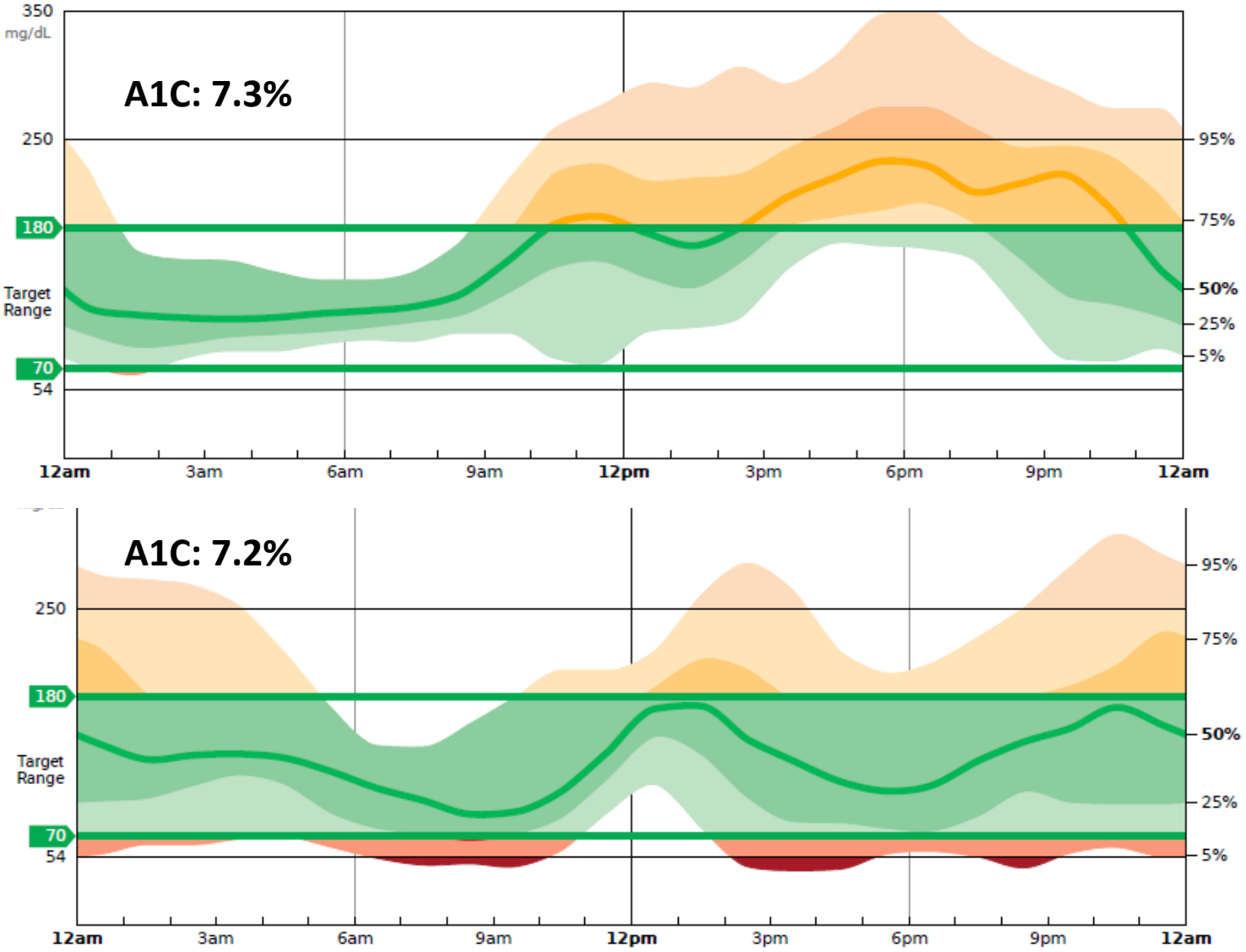
Fallibility of A1C as a dependable marker of glycemia in older adults

Conditions commonly seen in elderly that may affect A1C levels

Conditions	Possible mechanisms	Change in A1C
Age	Unknown/ ↑ insulin resistance	
Race – AA / Hispanic	unknown	
Iron deficiency anemia	↓ RBC turnover	
Recent infection	Insulin resistance	
Transfusion	↑ RBC turnover	
Hemodialysis	↓ RBC life span	
Erythropoietin therapy	↑ young RBC/↓ RBC life span	
Metabolic acidosis / uremia	Carbamylation of hemoglobin	
Anemia of chronic diseases	Unknown	

Leung E…….Munshi MN. Diabetes Spectrum 2018; 31 (3);245

A1C does not reflect glycemic excursions



Frequent Hypoglycemic Episodes Detected by Continuous Glucose Monitoring (CGM)

age>70 yrs; A1C>8%; n=40

Patients with hypoglycemia n = 26 (65 %)

Patients with A1C 8-9 %	14 (54 %)
Patients with A1C > 9 %	12 (46 %)

Severity of hypoglycemic episodes

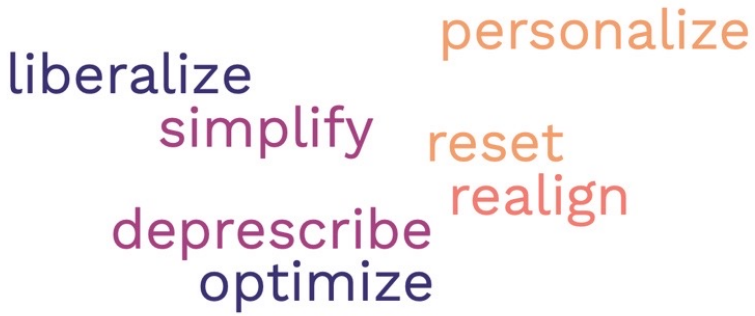
60-69 mg/dl	100 %
50-59 mg/dl	73 %
< 50 mg/dl	46 %

Munshi et al; Arch Intern Med. 2011;171(4):362-364

Strategies to overcome the barriers

- Different clinicians have different understanding
  - Better explanation, specific algorithms
- Deprescribing all medications are not the same
  - Deprescribing is not the right word for what is needed for diabetes management (our suggestions is re-alignment)
- Difficulty with parameters for glycemic goal: Fallibility of A1c.
  - Better use of technology to re-align

Medication de-intensification
Concept is accepted – Methods are confusing



Example: Liberalization of goals

- 89 yo with CAD, CHF, ESRF, recent falls
- Lives alone, cooks and eats by himself
- Pt is on basal bolus regimen due to contraindications to all other meds
- Finger stick glucose 70-150, A1c is 7.1

Liberalization

- Higher A1C or glucose goals
- For patients who are unlikely to benefit from tighter control and may be harmed

Strategy for this case :

- Avoid dependence only on A1c
- liberalize the goal BG 100-200 mg/dl(avoid below 90 mg/sl)

Munshi MN, Neumiller J; The Lancet Diab and Endo 2019

Example: De-intensification

- 81 yo on 3 antihypertensive meds, 2 lipid-lowering meds
- For diabetes, on metformin bid, glipizide bid, and GLP1-RA once a day
- Forgets 2-3 doses of medications per week
- not checking fingersicks

De-intensification

- To decrease the burden of therapy
- For patients with polypharmacy, non-adherence, difficulty coping, having side-effects
- Discontinue non-essential medications, use long-acting formulations

Strategy for this Case :

- Add basal insulin,
- Take away glipizide and metformin
- Consider extended release forms

Munshi MN, Neumiller J; The Lancet Diab and Endo 2019

Example: Simplification

- 84years old patient with T2D on basal bolus insulin for past 25 years.
- Recently hospitalized for stroke, unable to check finger sticks or take multiple injections
- Lives with supportive family but they work and not at home during day time

Simplification

- Simplify strategy to match patient's coping ability
- When treatments are overly complex, difficulty following regimen consistently
- Change strategy that is easier for patients or caregiver

Strategy for this Case:

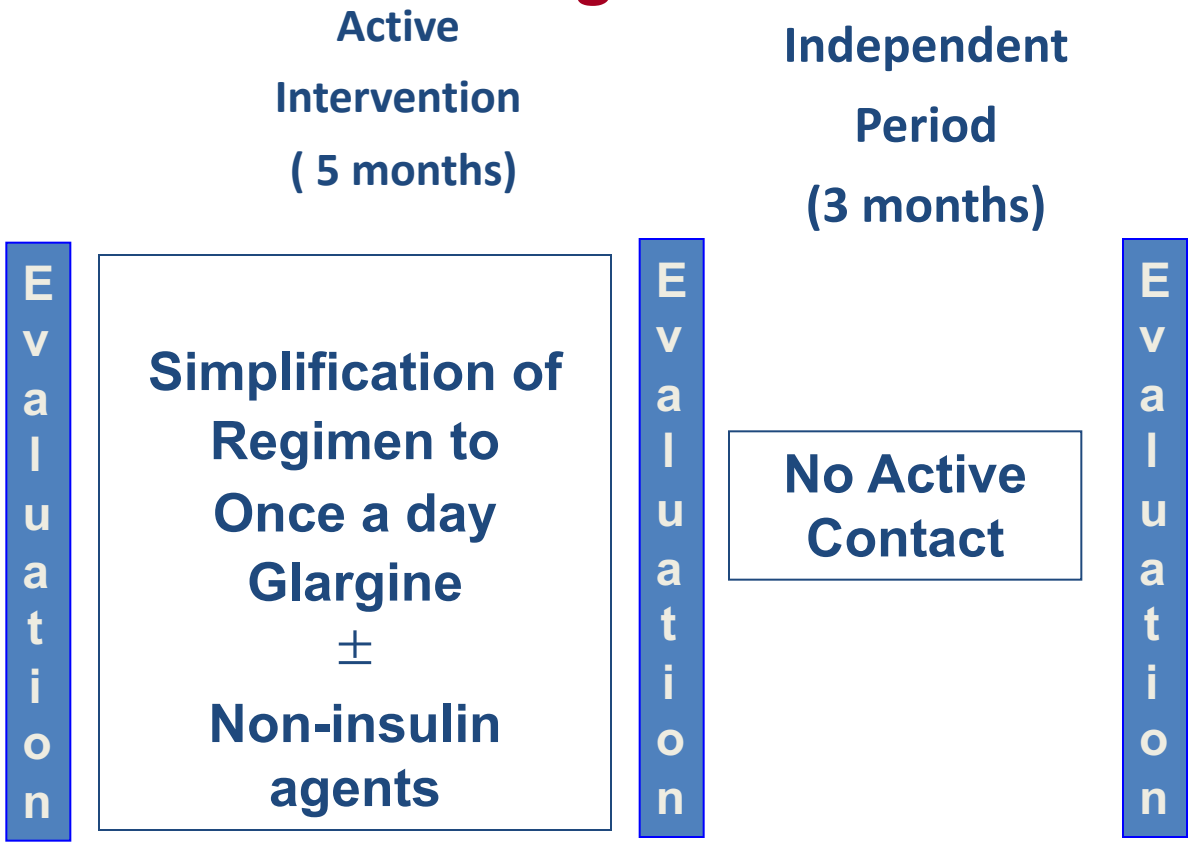
- simplified strategy: basal insulin in the morning with noninsulin agents for post-prandial coverage

Munshi MN, Neumiller J; The Lancet Diab and Endo 2019

SIMPLE study

Simplification of Insulin Regimen

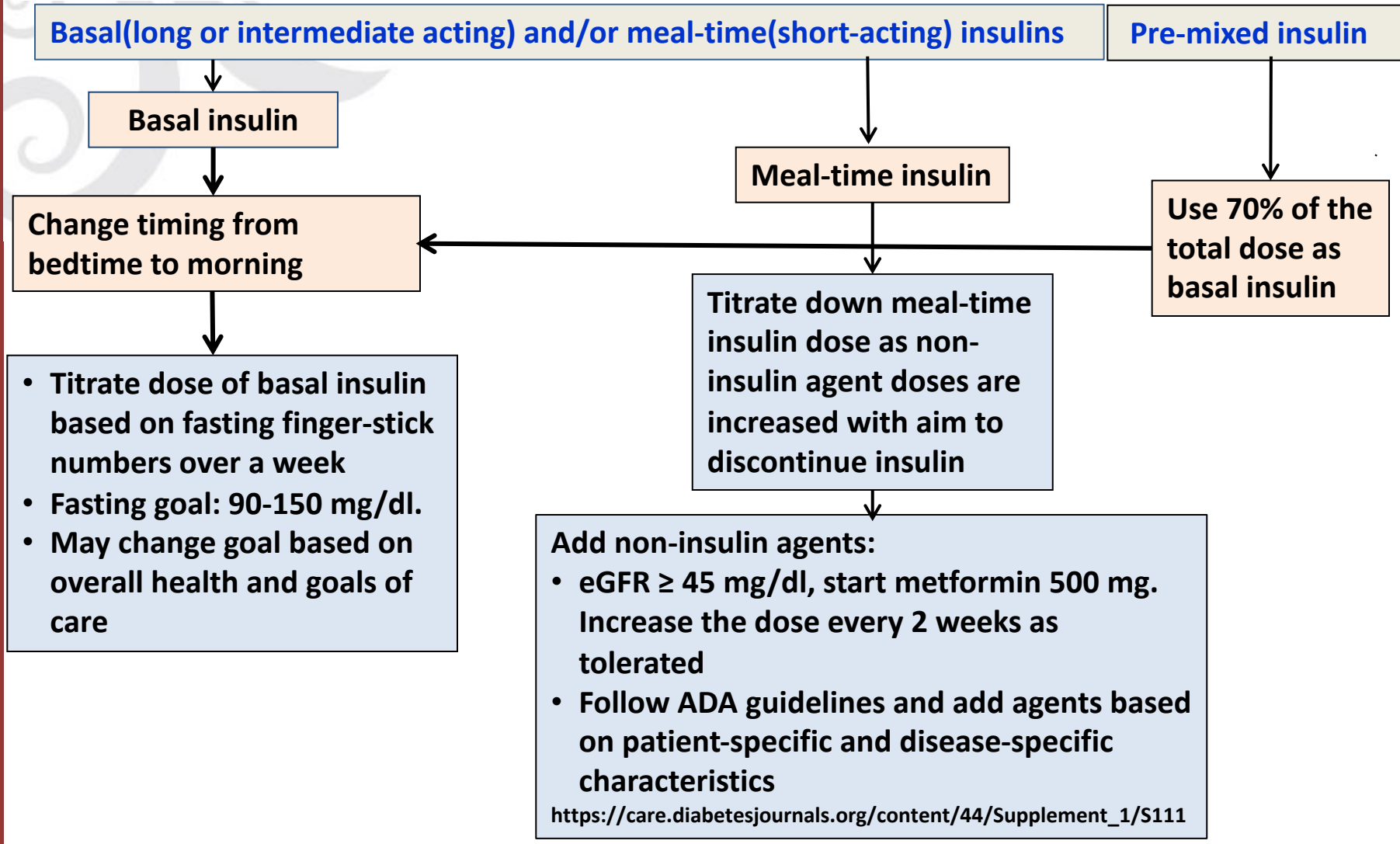
- Age >70 yrs
- ≥ 1 insulin injection/day
- High stimulated c-peptide
- ≥ 1 episode of glucose <70



- -Hypo duration ↓ from 277 min to 111 min at 5 months
- - Further ↓ to 97 min at 8 months
- -No significant change in A1C 7.7 % , 7.5 %, 7.7%

Munshi et al, *JAMA Intern Med* 2016 July 1:176(7):1023-5

Algorithm for Simplification of Insulin Regimen
From multiple injections to once-a-day long-acting (basal)+ non-insulin agents



Munshi et al, *JAMA Intern Med* 2016 July 1:176(7):1023-5
SOC ADA 2019; D Care; Jan 2021; S111

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International Geriatric Diabetes Society Deprescribing Consensus Initiative

Optimization of Diabetes Treatment Regimens in Older Adults

Role of De-prescribing, De-intensification and Simplification of Regimens

May 2023

Boston, Massachusetts

Realigning diabetes regimens in older adults:
simplification and deprescribing strategies using the 4S framework

Realigning diabetes regimens in older adults

All older adults with diabetes → Follow guidelines from ADA, EDWPOP, IDF, Endocrine society

Older adults on diabetes Failing current therapy → Realignment of treatment strategy 4S framework

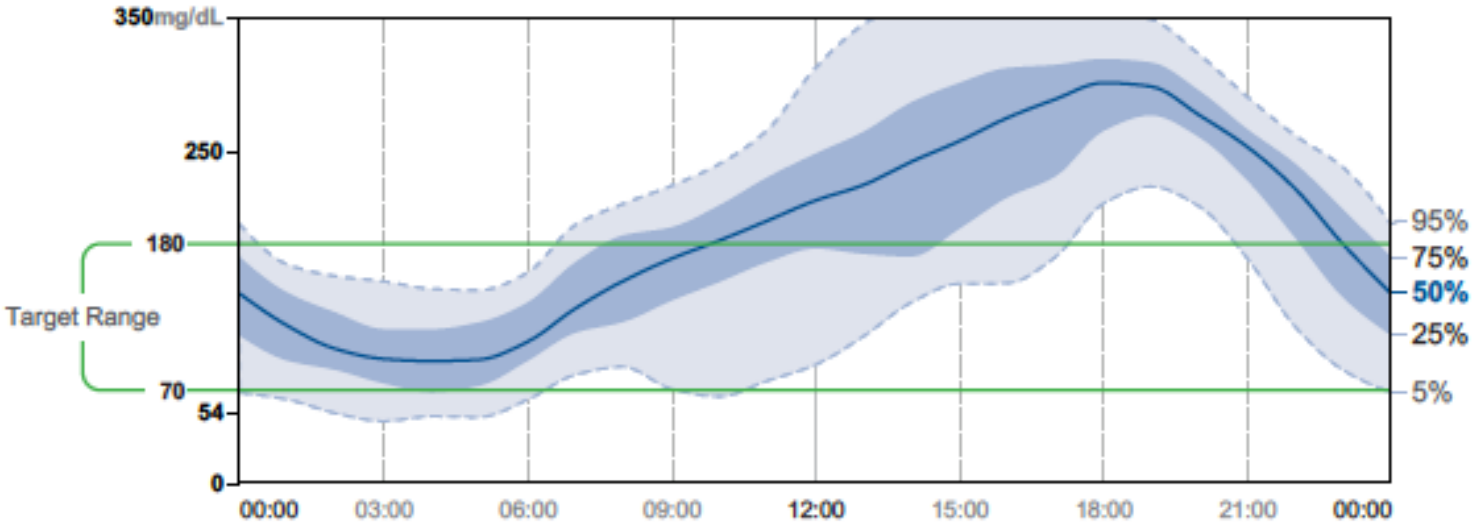
-**S**leuthing for reason for change
-**S**hared decision making
-**S**et and Reset the goals
-**S**implify

How does technology help with treatment decisions in older adults?

Case : Ms. RW

- 83-year-old independently living patient
- Type 2 diabetes for 20 years
- Current A1C is 8.9%
- Only performs fasting glucose: 120-160 mg/dl
- Current regimen
  - Basal insulin 30 u bid, meal-time insulin 10 u bid
  - Metformin 1000 mg bid
  - Sitagliptin 100 mg q day

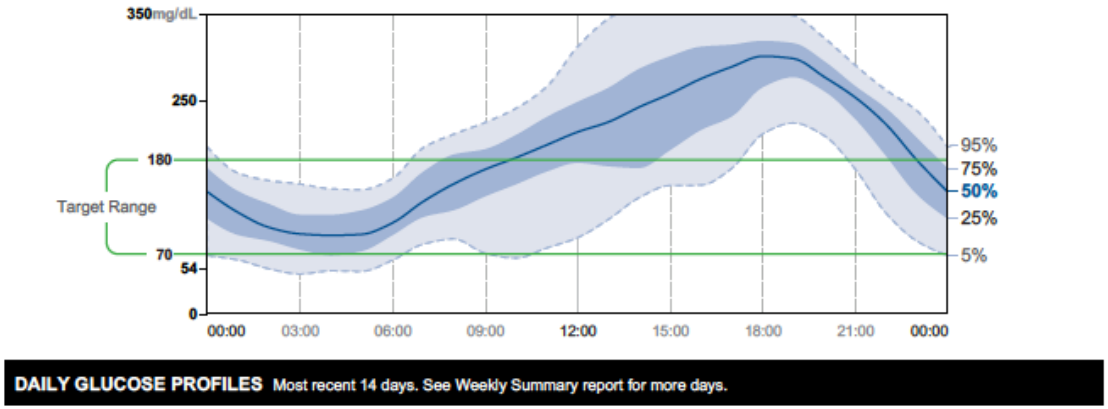
Case: Ms. RW



DAILY GLUCOSE PROFILES Most recent 14 days. See Weekly Summary report for more days.

Current regimen:
Basal insulin 30 u bid, meal-time insulin 10 u bid
Metformin 1000 mg bid
Sitagliptin 100 mg q day

Strategy Change based on CGM



- High all day and drops a lot overnight
- Change to basal insulin 65u in AM (total dose /day plus a little because of very high post prandial BG
- Stop meal-time insulin
- Metformin 2000 mg in the morning because needs more coverage in the daytime
- discontinue sitagliptin (minimal impact)

Summary

- Why do we need to consider “deprescribing” in older adults with diabetes?
  - When the risks of current therapy outweighs the benefit
- What are the barriers to ”de-prescribing”-specifically in diabetes management ?
  - Miscommunications regarding intent within providers between the clinician and their patients
  - Lack for clear algorithms
- Strategies for deprescribing medications in older adults with diabetes
  - Need deliberate changes in strategy to overcome patient-specific barriers
  - 4S framework

Aging Successfully

Dr. Joslin age 91

Dr. Joslin age 90