



## BACKGROUND

- In 2018, an estimated 13.2% of American adults with diabetes delayed filling their insulin, took less, or skipped a dose due to cost
- Recent studies demonstrate human insulins exhibit no significant difference in HgA1c or hypoglycemic events while improving costs to the patient and health care system
- Models estimate a 20% increase in the amount of insulin required to manage diabetes between 2018 and 2030, with an increase in diabetic patients to 552 million by 2030

## OBJECTIVES

- Appreciate the reasons, process, and benefit of implementing a switch from insulin analogues to human insulin
- Identify possible barriers to the implementation of human insulin on a health system formulary
- Identify additional interventions made by clinical pharmacists integrated into a primary care clinic

## METHODS

- IRB Exempt
- Developed Collaborative Practice Agreement with SFM and SIM providers
- Prospective Study

### Inclusion:

- ≥18 years old
- HgA1c ≤8% within 6 months
- Currently using insulin analogue and willing to switch to human insulin

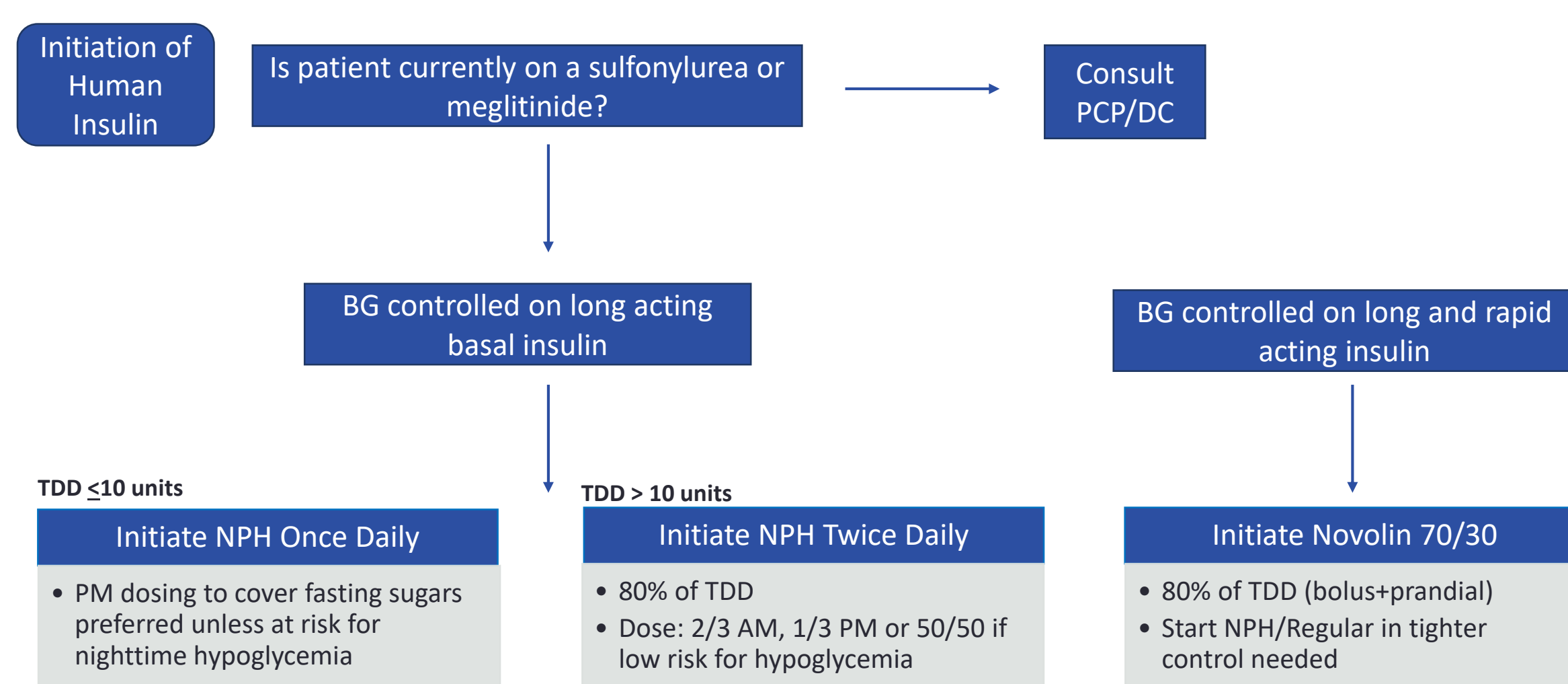
### Exclusion:

- CKD stage 3 or 4, or on dialysis
- History of hospitalization due to hypoglycemia

### Patient Visit:

- Face-to-face appointment
  - Initial 60 min, Follow-up 15-30 min

### Insulin Dosing Algorithm:



## RESULTS

Characteristic	No. (%)
Age, mean	69
Men (%)	14 (78)
Daily medications, mean	11; range: 6-16
Insulin pen before pilot (%)	10 (56)
Insulin vial before pilot (%)	6 (33)
Vial and pen before pilot (%)	2 (11)
Baseline HgA1c, mean	7.5; Range: 6.0 - 11.7

FIGURE 1: BASELINE PATIENT CHARACTERISTICS

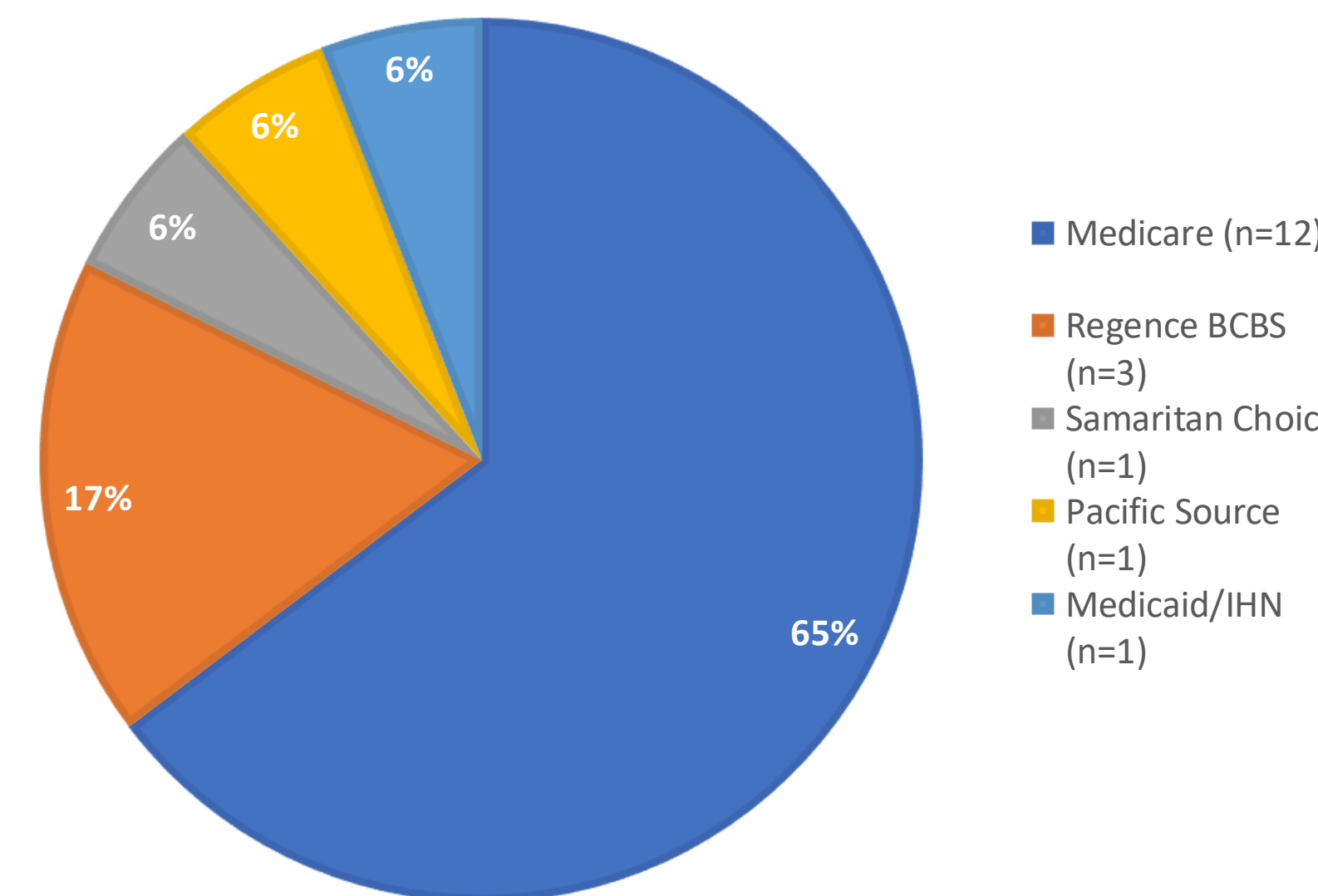


FIGURE 2: PATIENT INSURANCE PROVIDERS

Patient	Baseline A1c	3-Month A1c	Difference
1	6	5.8	-0.2
2	7.6	6.9	-0.7
3	6	5.7	-0.3
4	7.1	7.7	0.6
5	7.1	7	-0.1
6	5.7	5.8	0.1
7	6.7	6.9	0.2
8	6.7	5.8	-0.9
9	8	6.8	-1.2
10	8.8	7.5	-1.3
11	9	8.3	-0.7
12	9.1	6.3	-2.8
13	6.2	6	-0.2
14	11.7	9.1	-2.6
<b>Average:</b>	<b>7.6</b>	<b>6.8</b>	<b>-0.7</b>

FIGURE 3: INCLUDES ALL PATIENTS WITH AN A1C COLLECTED

Patient	Baseline A1c	3-Month A1c	Difference
1	6	5.8	-0.2
2	7.6	6.9	-0.7
3	6	5.7	-0.3
4	7.1	7.7	0.6
5	7.1	7	-0.1
6	5.7	5.8	0.1
7	6.7	6.9	0.2
8	6.7	5.8	-0.9
9	8	6.8	-1.2
10	8.8	7.5	-1.3
11	9	8.3	-0.7
12	9.1	6.3	-2.8
13	6.2	6	-0.2
<b>Average:</b>	<b>7.2</b>	<b>6.7</b>	<b>-0.6</b>

FIGURE 4: EXCLUDES OUTLIER PATIENT

	Cost benefit/month	Estimated annual benefit	Estimated benefit/month	Estimated annual benefit
Patient			Insurer	Insurer
1	\$280	\$3,360	\$175	\$2,100
2	\$0	\$0	\$720	\$8,640
3	\$270	\$3,240	\$1,000	\$12,000
4	\$25	\$300	\$175	\$2,100
5	\$15	\$180	\$345	\$4,140
6	\$0	\$0	\$175	\$2,100
7	\$75	\$900	\$450	\$5,400
8	\$20	\$240	\$330	\$3,960
9	\$55	\$660	\$160	\$1,920
10	\$0	\$0	\$1,000	\$12,000
11	\$0	\$0	\$175	\$2,100
12	\$50	\$600	\$500	\$6,000
13	\$55	\$660	\$1,000	\$12,000
14	\$112	\$1,344	\$700	\$8,400
15	\$225	\$2,700	\$330	\$3,960
16	\$22	\$264	\$345	\$4,140
17	\$75	\$900	\$434	\$5,200
<b>Average</b>	<b>\$75</b>	<b>\$900</b>	<b>\$471</b>	<b>\$5,024</b>
<b>Total</b>	<b>-</b>	<b>\$15,348</b>	<b>-</b>	<b>\$85,420</b>

FIGURE 5: FINANCIAL RESULTS

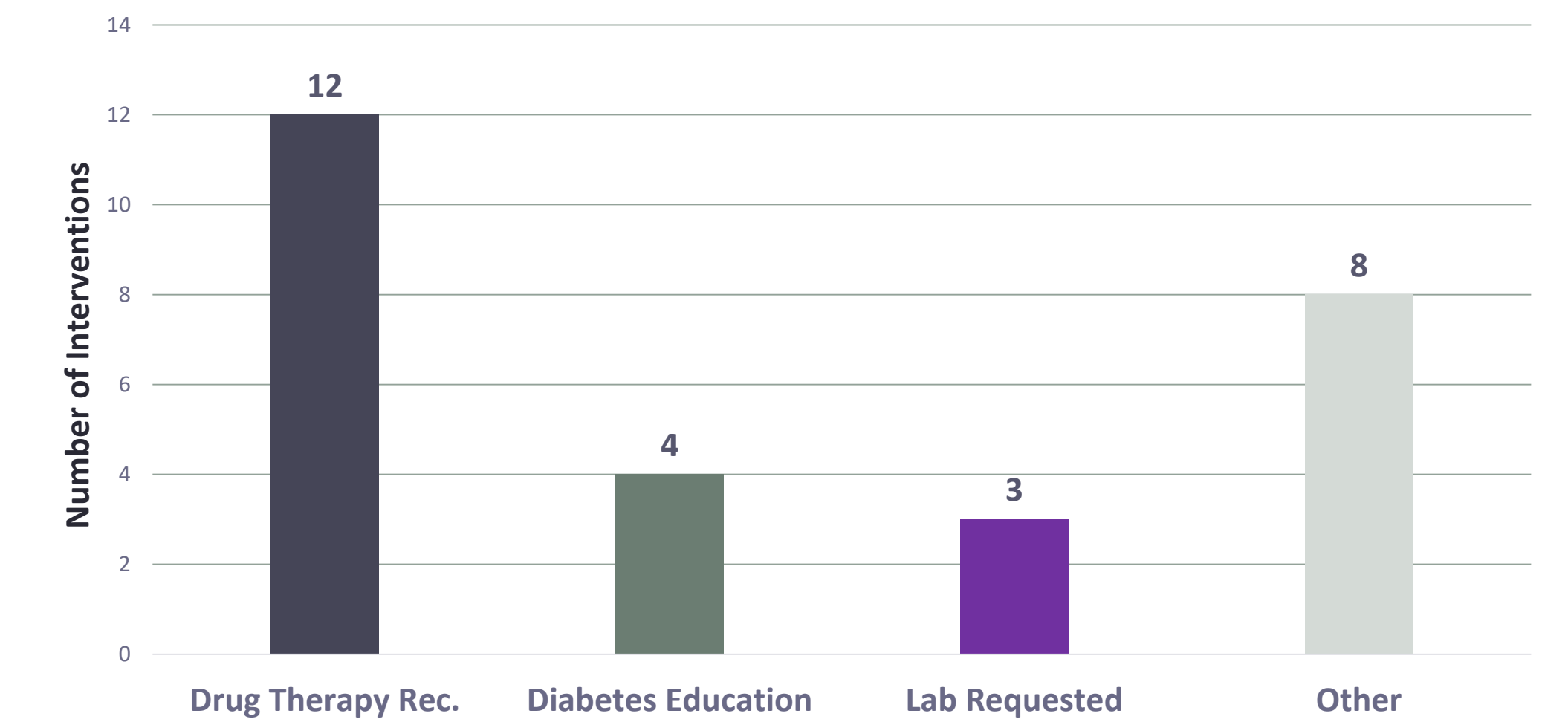


FIGURE 6: INTERVENTIONS MADE BY PHARMACISTS THROUGHOUT THE PILOT

## CONCLUSIONS

- A more efficient and effective method of identifying and enrolling patients is needed
- Use of human insulin was noninferior to insulin analogues in safety and effectiveness
- Use of human insulin may result in significant cost savings to the patient and to the health system as a whole
- Expansion of pharmacists into primary care clinics may improve follow-up, adherence, and optimization of patient medications
- Collaboration with Diabetes Education improved access to care

## FUTURE IMPLICATIONS

- Expand pharmacist participation in the transition and management of patients on human insulin
- Continue to expand participation with diabetes education and improve access to care
- Long-term goal: Expansion of pharmacist integration into primary care clinics for the management of chronic disease states

## ACKNOWLEDGEMENTS

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## REFERENCES

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