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Assessing Consistency with Standards of Care Recommendations for Patients with Type 2 Diabetes at Hospital Discharge

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OBJECTIVE

- To assess the number of patients prescribed diabetic regimens consistent with American Diabetes Association (ADA) Standards of Care recommendations upon hospital discharge.[1]

BACKGROUND

- Patients with diabetes are commonly prescribed complex medication regimens requiring frequent adjustments to ensure safety and efficacy.
- The American Diabetes Association (ADA) recommends that patients with type 2 diabetes admitted to the hospital have oral diabetes medications held and insulin therapy initiated.[2]
- Though insulin is preferred while inpatient, it is not a common first line agent in outpatient therapy.
- It has been reported that patients' diabetes discharge regimens may be inconsistent with either ADA Standards of Care recommendations or patients' own previous diabetes regimen.
- A recent study employed pharmacists to conduct medication reviews at hospital admission and discharge for diabetic patients and 29.4% of patients had at least one medication error.[3]
- Focusing on diabetic transitions of care from inpatient to outpatient has been associated with reduced hospital readmission rates.[4]

METHODS

- **Study Design:** Institutional Review Board (IRB) approved retrospective chart analysis of patients with type 2 diabetes admitted to a Parkview hospital between July 1, 2019 and July 1, 2021.
- **Inclusion Criteria (must meet all):**
  - HbA1c ≥6.5% in 90 days before or after hospitalization
  - Type 2 diabetes diagnosis
  - At least two blood glucose readings >180 mg/dL during hospitalization
- **Exclusion Criteria (must not meet any):**
  - Diagnosis of type 1 diabetes
  - Received parenteral nutrition or tube feeds during hospitalization
  - Discharged to hospice
- **Primary Outcome:** Number of patients prescribed diabetic regimens consistent with Standards of Care recommendations or their own previous diabetes regimen upon hospital discharge
- **Secondary Outcomes:**
  - Patients with HbA1c >10% discharge regimen consistent with Standards of Care or own previous home regimen
  - Patients with HbA1c ≤10% discharge regimen consistent with Standards of Care or own previous home regimen
  - Percentage of patients discharged with new basal, bolus, or basal and bolus insulin
  - Percentage of patients discharged with any insulin that was discontinued at patient's first primary care visit post-hospitalization

RESULTS

Table 1.

Baseline Characteristics	n=5495
Age (median age in years, IQR)	67 (58-76)
Male (n, %)	2809 (51%)
BMI (median BMI, IQR)	33 (28-39)
Past Medical History (n, %)	
ACS/MI, angina, and/or PAD	995 (18%)
Stroke/TIA	621 (11%)
Renal dysfunction	1852 (34%)
Smoking	965 (18%)
A1c (median %, IQR)	7.8 (7.0-9.1)
CrCl (median mL/min, IQR)	55 (36-81)
Steroid use inpatient (n, %)	990 (18%)

Table 2.

Characterization of Discharge Regimens	n=5495
Inconsistent with Standards of Care	n=478
Bolus started prior to starting basal	241 (50.4%)
Basal and/or bolus inappropriately started	177 (37.0%)
Started multiple agents concomitantly	36 (7.5%)
Unclear reason for not initiating metformin	20 (4.1%)
DPP-4 + GLP-1	4 (0.84%)
Consistent with Standards of Care	n=5016
No changes at discharge	3966 (79.1%)
No new meds at discharge	575 (11.4%)
Standards of Care consistent changes	475 (9.5%)

Figure 1. Discharge Regimen Consistent with Standards of Care or Own Previous Home Regimen

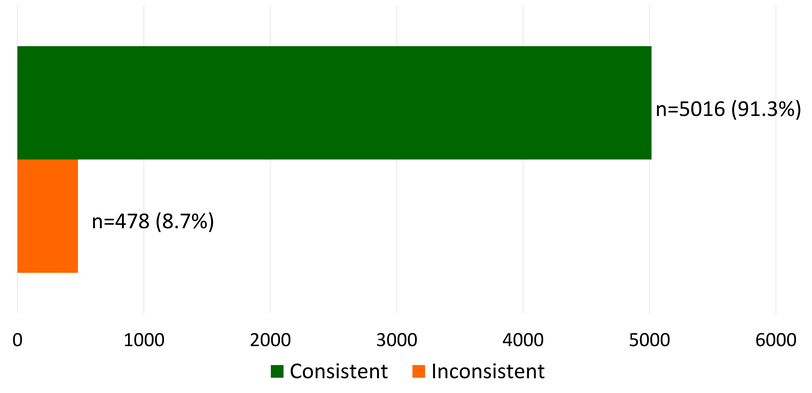
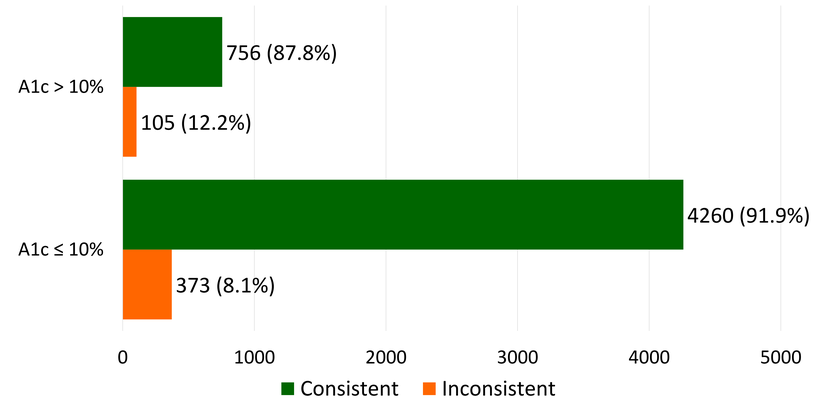


Figure 2. Discharge Regimen Consistent with Standards of Care or Own Previous Home Regimen: A1c Subgroup Analysis



RESULTS

Figure 3. Percentage of Patients Discharged with New Insulin

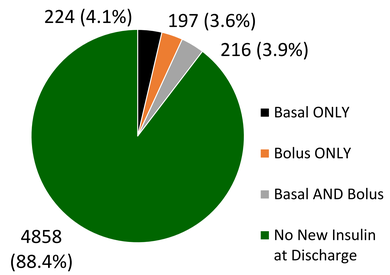
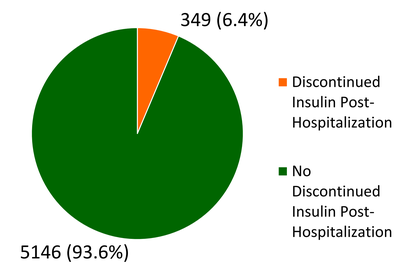


Figure 4. Percentage of Patients with Any Insulin Discontinued at First Office Visit Post-Hospitalization



DISCUSSION & CONCLUSIONS

- Although over 91% of patients were discharged on ADA Standards of Care consistent regimens, there remain opportunities for improvement.
  - Nearly 90% of inconsistent discharge regimens related to inappropriate initiation of insulin at discharge, which may indicate over-use of insulin after hospitalization.
  - Over 50% of patients with inconsistent regimens had bolus insulin initiated without prior basal insulin which may be indicative of patients getting discharged on sliding scale insulin—these patients may be good candidates for oral or non-insulin agents.
  - Almost 20% of patients received corticosteroids while inpatient, which may have played a part in these decisions at discharge.
- A numerically larger portion of patients in the A1c ≤10% group had discharge regimens inconsistent with Standards of Care.
  - This specific group would likely have more appropriate opportunity to start non-insulin agents upon discharge, such as metformin, GLP-1 agonists and SGLT-2 inhibitors that have significant evidence to support use as first line agents.
- Over 300 patients, or 6.4% of patients included in this study had insulin discontinued after hospital discharge.
  - There are risks associated with unnecessary initiation of insulin, including safety in patients newly introduced to these agents as well as additional financial burden.
  - Unnecessary initiation of insulin also provides burden to outpatient providers, including pharmacists, as discontinuation of new prescriptions may contribute to further patient confusion and distrust of healthcare providers.
- This study was limited by retrospective design and lack of sufficient documentation for therapeutic decisions regarding discharge regimens, potentially skewing data.
- The findings of this study suggest opportunity for provider education, creation of discharge tools, and potential pharmacist intervention to ensure discharge regimens are consistent with ADA Standards of Care and to prevent unnecessary changes and confusion for patients.

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Disclosure

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