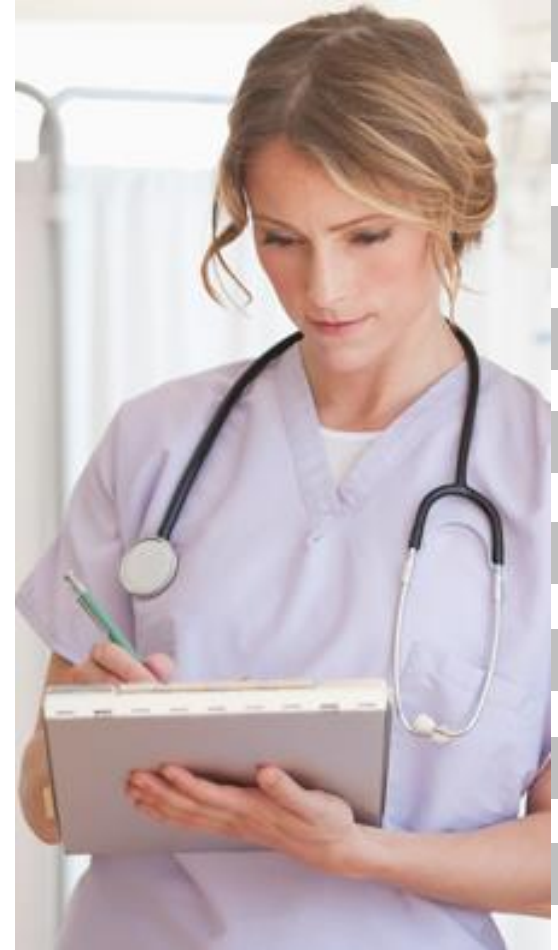


Diabetes Care Transitions in the Hospital: **Preventing Readmissions**

Jane Jeffrie Seley DNP, MSN, MPH, RN, GNP, BC-ADM, CDE, CDTC, FAAN

Program Manager & Diabetes Nurse Practitioner
Inpatient Glycemic Control Program
Division of Endocrinology, Diabetes & Metabolism
NewYork-Presbyterian Hospital/ Weill Cornell Medicine
New York, NYE, FAAN





Goals

Discuss successful strategies to prepare patients to return home on a diabetes discharge regimen that is:

- individualized
- safe and effective
- *and* helps prevent readmission

Donihi, A. C. (2017). Practical Recommendations for Transitioning Patients with Type 2 Diabetes from Hospital to Home. *Current Diabetes Reports*, 17(7), 52.
American Diabetes Association. (2018). 14. Diabetes Care in the Hospital: Standards of Medical Care in Diabetes—2018. *Diabetes care*, 41(Supplement 1), S144-S151.

Hirschman, K. B., & Bixby, M. B. (2014). Transitions in care from the hospital to home for patients with diabetes. *Diabetes Spectrum*, 27(3), 192-195.

Objectives

At the end of this program the participant will be able to:

- Identify hospitalized people with diabetes at high risk for readmission
- List several key strategies known to reduce readmission rates in people with diabetes
- State how to tailor the discharge regimen based on the current A1c and patient ability to learn

Scope of the Problem:

Barriers to Planning an Effective Discharge

- Shorter lengths of stay: ~4+ days
- Lack of effective diabetes self-management education during hospital stay
- Impaired ability to learn during acute illness e.g. changes in cognition, anxiety, pain, noise, interruptions
- Family/caregivers not present during education to reinforce teaching at home
- Prescriptions may be incorrect, missing, or not covered in plan

Rubin, D.J., Meneghini, L. F., Seley, J.J., Cagliero, E., Gaudiani, L. M., Gilden, J. L., (2016). Chapter 30 Transition of Care: Discharge from the Hospital. In *Managing Diabetes and Hyperglycemia in the Hospital Setting*. Draznin B, Ed. Alexandria, VA, American Diabetes Association.

Seley, J.J. (2017). Diabetes Care in the Inpatient Setting, Chapter 34 in *Complete Nurse's Guide to Diabetes Care* (3rd ed.), Childs, B.P., Cypress, M., & Spollett, G. (Eds): American Diabetes Association, Alexandria, VA.

Polling Question

The readmission rate for people with a history of diabetes is about 26%.

- A. True
- B. False

Hospital Readmission Rates

for People with Diabetes (DM)

Rubin (2015)

- ALL Patients: 8.5 – 14%
- DM Patients: 10 – 21%

Ostling, et. al. (2017)

- 22% w/o DM vs.
- 26% with DM (n=7763)

All Adult Encounters:

inpatient, emergency department (ED), observation

- 17.7% w/o DM¹⁷
- 24.3% w/DM (n=37,702)

According to Ostling ...

- Most common cause for readmission is infection-related
- Direct medical costs for DM inpatients = \$75.68 billion for all hospital admissions (2012 data)

1. Rubin DJ. Hospital Readmission of Patients with Diabetes. *Current Diabetes Reports*. 2015;15:1-9

2. Ostling, S., Wyckoff, J., Ciarkowski, S. L., Pai, C. W., Choe, H. M., Bahl, V., & Gianchandani, R. (2017). The relationship between diabetes mellitus and 30-day readmission rates. *Clinical Diabetes and Endocrinology*, 3(1), 3.

3. American Diabetes Association Scientific Statement. Economic Cost of Diabetes in the US in 2012. *Diabetes Care* 36:1033–1046, 2013

Polling Question

Which of the following is NOT a known risk factor for 30-day readmission for people with diabetes?

- A. Recent emergency department visit
- B. No health insurance
- C. African-American or Hispanic
- D. History of renal insufficiency, heart failure and asthma

Risk Factors for Readmission

According to the literature:

- Admitted through ED
- Public insurance (Medicare, Medicaid)
- Socio-economic status
- Racial/ethnic minority
- Multiple comorbidities
- Prior hospitalization and/or ED visits
- Prior diabetes diagnosis not known

Rubin DJ, Handorf EA, Golden SH, Nelson DB, McDonnell ME, Zhao H. *Endocr Pract.* 2016 Oct;22(10).



MORE Risk Factors for Readmission?

What other factors do we suspect?

- A1c > 9%
- Going home on insulin for first time
- Going home on COMPLICATED insulin regimen (e.g. calculating mealtime dose)
- Last minute discharge planning/ teaching
- Poor health literacy/numeracy
- No financial resources for diabetes supplies
- **OTHER:** elderly, no social support, regimen does not match patient, language not accommodated

Rubin, D.J., et al., Early readmission among patients with diabetes: a qualitative assessment of contributing factors. *Journal of Diabetes and Its Complications*, 2014. 28(6): p. 869-73
Rubin, D.J., Meneghini, L. F., Seley, J.J., Cagliero, E., Gaudiani, L. M., Gilden, J. L., (2016). Chapter 30 Transition of Care: Discharge from the Hospital. In *Managing Diabetes and Hyperglycemia in the Hospital Setting*. Draznin B, Ed. Alexandria, VA, American Diabetes Association.

Decreasing 30-Day Readmission Rates in High-Risk People with Diabetes:

A Feasibility Study at NewYork-Presbyterian (NYP)/Cornell

- Chart Reviews from Dec 2014 - May 2015 revealed: 64% of Weill Cornell inpatients with diabetes in the medicine service with A1c >9% were *readmitted* within 90 days
- No *standardized* transitional care program for high-risk people with diabetes
- **Aim: Decrease 30-day readmission rates** for *high risk* people with diabetes in medicine service line using an evidence-based transitional care program of interventions

Sinha, N. & Seley, J.J. (Co-Principal Investigators) and the study group (2015). Decreasing 30 Day Readmission Rates in High Risk Diabetes Patients: An Interdisciplinary Transitional Care Project; IRB Protocol #1502015876, Weill Cornell Medicine Department of Medicine Quality Improvement & Patient Safety Project (QIPS).

Polling Question

According to current research, which strategy is most effective in preventing readmission in people with diabetes?

- A. Med-to-bed medication delivery
- B. Follow-up phone call within 3 days of discharge
- C. Sending a visiting nurse to the home
- D. Diabetes self-management education

Dungan, K., et al., An Individualized Inpatient Diabetes Education and Hospital Transition Program for Poorly Controlled Hospitalized Patients with Diabetes. *Endocr Pract*, 2014; p. 1-24.
Healy, S.J., et al., Inpatient diabetes education is associated with less frequent hospital readmission among patients with poor glycemic control. *Diabetes Care*, 2013. 36(10): p. 2960-7.
Wexler, D.J., et al., Impact of inpatient diabetes management, education, and improved discharge transition on glycemic control 12 months after discharge. *Diabetes Res Clin Pract*, 2012. 98(2): p. 249-56.

Plan:

- Test feasibility of several key strategies known to prevent readmission in people with diabetes

In Hospital:

- A1c to determine eligibility and diabetes therapy
- Med-to-bed prescription delivery
- Diabetes education

Post Discharge:

- 3 day follow-up phone call
- 7 day outpatient visit

Diabetes Education



Med-to-Bed

3-Day
Phone Call

7-Day
Outpatient
Visit

Obtaining A1c

at NYP/Cornell Campus

- 80 charts were found to have 2 or more BGs >180 mg/dL (10 mmol/L) in 24 hours, A1c requested by research assistant
- Took 1-3 days with multiple requests to get A1c ordered on 48 of the 80 patients with hyperglycemia
- 32 of the 80 patients *never had an A1c ordered* prior to discharge
- **Lesson learned: Consider *auto-selecting* A1c order in insulin order set to 'if A1c not done within past 2-3 months' to facilitate timely result**

Seley, J.J., Sinha N., et al (2016) Designing a Transitional Care Program for High-Risk Diabetes Patients: A Feasibility Study. 76th American Diabetes Association Scientific Sessions New Orleans, LA; June 13.

Med-To-Bed Medication Delivery

Results: 61.1% (n=22) received medication reconciled to match insurance and delivered to bedside prior to discharge

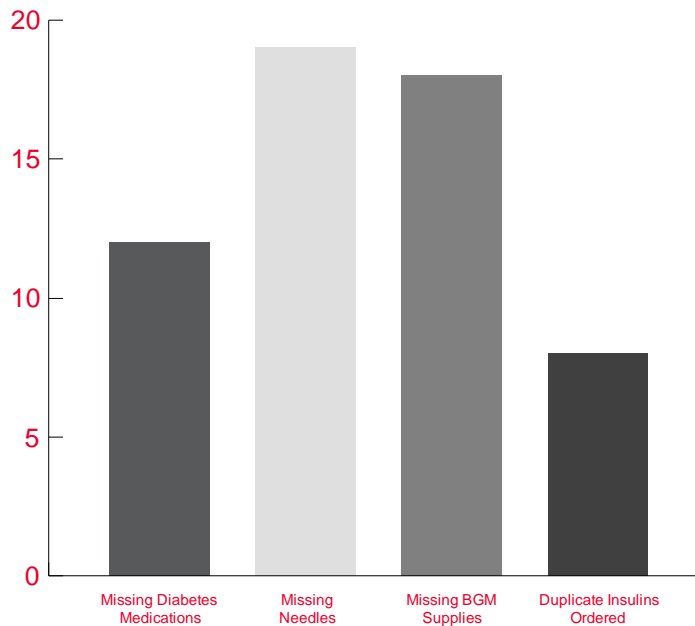
Barrier: Delays in obtaining prescriptions to send to med-to-bed pharmacy, med-to-bed pharmacy didn't check for missing prescriptions (e.g. needles, test strips)

Reason for delay in writing prescriptions: Prescriber uncertainty about what meds/doses patient would go home on

Lesson learned: Get prescriptions for current diabetes medications at current dose to check which insulin/devices are covered

“Right” Prescriptions?

Number of Incomplete/Incorrect Prescriptions



78.3% of the 95.9% of people with prescriptions for insulin had no prescription for needles



Pocket Card for Writing Prescriptions

Ordering Insulin & Diabetes Supplies in Electronic Medical Record (EMR): Check edit and free text for all supplies EXCEPT Insulin Pens

Drug Search Term

BOLUS: NovoLog Flexpen® or Humalog KwikPen®

BASAL: Lantus®U100 or Toujeo® U300 Solostar Pen® or Levemir® or Tresiba® U100 or U200 FlexTouch Pen®

PREMIX: NovoLog Mix 70/30 Flexpen® or Humalog Mix 75/25 KwikPen®

NPH: Humulin N Kwik Pen®

BD Nano 4mm or DUO (safety) pen needles

BD Ultrafine 6 mm 1/2 ml insulin syringe (holds up to 50 units)

BD Ultrafine 6 mm 1 ml insulin syringe (holds up to 100 units)

Accu-Chek Connect, Bayer Contour Next EZ, FreeStyle Freedom LITE OR OneTouch Verio IQ blood glucose meters

Accu-Chek Connect, Bayer Contour Next EZ, FreeStyle Freedom LITE OR OneTouch Verio IQ test strips and lancets

Instructions

Take (range, up to) _____ units before meals

Take _____ units at _____ AM/PM

OR

Take _____ units at _____ AM

AND

Take _____ units at _____ PM

Dispense #100 (or #200) use as directed

Dispense #100 (or #200) use as directed

Dispense #100 (or #200) use as directed

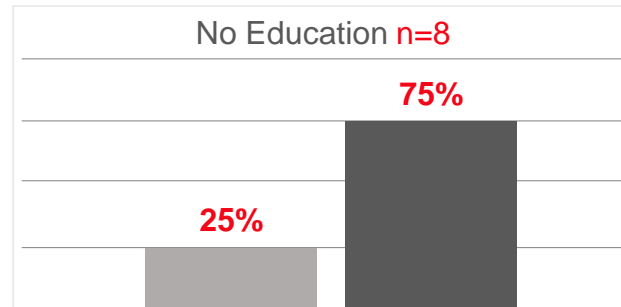
Dispense: 1 meter, use as directed

Check blood glucose _____ x/day,

Diabetes Self-Management Education



- Results: 77.8% (n=28) received diabetes self-management education prior to discharge
- Diabetes education was often delayed *until the day of discharge*, not allowing the patient an opportunity to practice new skills
- **75% of the 8 patients who had no diabetes education were readmitted within 30 days**



Can Inpatient Diabetes Education Decrease Readmission Rates and Lower A1c?

- Wexler, D.J., et al., 2012. Impact of inpatient diabetes management, education, and improved discharge transition on glycemic control 12 months after discharge. **METHODS:** Provided diabetes education, management and transition to outpatient care to adults with T2DM + a1c>7.5%. **RESULTS:** Improved A1c 1 year post discharge in patients new on insulin (A1c ↓ 2.35%, p=0.04, n=31).
- Healy, S.J., et al., Inpatient diabetes education is associated with less frequent hospital readmission among patients with poor glycemic control. **METHODS:** Retrospective chart reviews to analyze relationship between inpatient education and readmissions in patients with poorly controlled DM. **RESULTS:** Patients who received formal inpatient DM education had decreased 30-day readmissions (11% vs. 16%, p=0.0001, n=2265).
- Dungan, K., et al., An Individualized Inpatient Diabetes Education and Hospital Transition Program for Poorly Controlled Hospitalized Patients with Diabetes. **METHODS:** Patients with T2DM received inpatient diabetes education and discharge support including follow-up calls and communication with primary care physician. **RESULTS:** Individualized inpatient DM education and transition to outpatient care significantly lowered A1c for patients with T2DM (↓2.8%, p<.0001, n=82).

Diabetes Self-Management Education

Promote EARLY Diabetes Education

- Teach bedside Registered Nurse (RN) and primary team to educate *high-risk* patients as soon as patient is ready to learn
- Use BG monitoring, insulin administration and meal trays as teaching moments
- Improve RN access to diabetes self-management tools: written survival skills educational material, insulin pen training supplies, and blood glucose meters to take home

Staff Education/Diabetes Champions



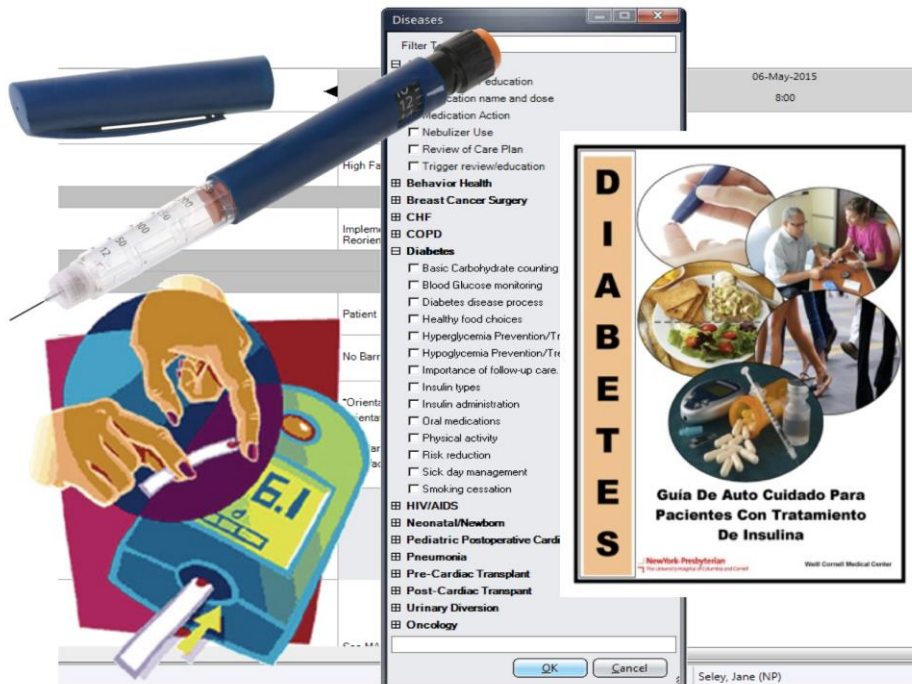
- Intensive *then* ongoing additional education for all clinicians that care for people with diabetes: MDs, NPs, PAs, PharmDs, RDs, RNs
- Focus on glycemic management AND patient education and preparation for discharge
- Diabetes Champions serve as *unit based* resource and mentor
- Most impact if champions are house-wide & *interdisciplinary*

-Jorsay D., Garnett D. (2014). Diabetes champions: Culture change through education. *Diabetes Spectrum*; 27:188-192, 2014.

-Corl D.E., McCliment S., Thompson R.E., Suhr L.D., Wisse B.E. Efficacy of diabetes nurse expert team program to improve nursing confidence and expertise in caring for hospitalized patients with diabetes mellitus. *J Nurses Prof Dev.* 30:134-142, 2014.

Diabetes Teaching Resources

- Teaching Checklist in EMR
- Practice Pens
- Free Meters
- Handouts in Multiple Languages



Healy S.J., Black D., Harris C., Lorenz A., Dungan K.M.. Inpatient diabetes education is associated with less frequent hospital readmission among patients with poor glycemic control. *Diabetes Care*. 36;2960-2967, 2013.

Insulin Pen Teaching

Safety

- RN education:
- Be Aware: Don't Share
- Barcoding insulin type and PATIENT ID
- Pen returned to patient specific drawer IMMEDIATELY after use EVERY TIME

Patient Education

- Generic pen handouts
- Teaching kits
- Label saline pens: "Do Not Inject"
- Beware of patient insulin pen needle errors

Institute for Safe Medication Practices Newsletter (2013, February). Ongoing concern about insulin pen reuse shows hospitals need to consider transitioning away from them. Available at: <http://www.ismp.org/newsletters/acutecare/showarticle.aspx?id=41>
Institute for Safer Medication Practice Newsletter (2014 October). A crack in our best armor: "Wrong patient" insulin pen injections alarmingly frequent even with barcode scanning. Available at: <https://www.ismp.org/newsletters/acutecare/showarticle.aspx?id=92>
Cobaugh D.J., Maynard G., Cooper L., Kienle P.C., Vigersky R., Childers D., Weber R., Carson S.L., Mabrey M., Roderman N., Blum F., Burkholder R., Dortch M., Grunberger G., Hays D., Henderson R., Ketz J., Lemke T., Varma S.K., Cohen M. Enhancing insulin-use safety in hospitals: Practical recommendations from an ASHP foundation expert panel. *Am J Health-Syst Pharm.* 7;1404-1413, 2013.

Institute for Safe Medication Practices (ISMP, 2017). Guidelines for Optimizing Safe Subcutaneous Insulin Use in Adults. Available at: <http://www.ismp.org/Tools/guidelines/Insulin-Guideline.pdf>
National Alert Network (NAN, 2017). Severe hyperglycemia in patients incorrectly using insulin pens at home. <https://www.ismp.org/NAN/files/NAN-20171012.pdf>

Tools You Can Use to Optimize Discharge Planning

Revised Discharge Insulin Algorithm

Choosing a Discharge Regimen

A1C < 8%

Restart outpatient treatment regimen (oral agents and/or insulin)

A1C 8%-10%

Restart outpatient oral agents and keep glargine once daily at 50% of hospital dose

A1C >10%

Discharge on basal/bolus at same hospital dose.

Alternative: Restart oral agents, keep glargine once daily at 80% of hospital dose

Umpierrez et al, Diabetes Care. 2014 Nov;37(11):2934-9.

NYP DATAVIS in ALLSCRIPTS

Diabetes Dashboard helps view insulin usage and BG results together for pattern identification to determine inpatient adjustments and best discharge regimen.

| | 4:31A - 10:30A | 10:31A - 3:00P | 3:01P - 7:30P | 7:31P - 4:30A |
|----------|--|--|---|--|
| 10/13/17 | BG Values: 261 (06:19) Insulin (units): Insulin Aspart Prandial Scale Pre-Meal 7 (08:29) | BG Values: 390 (12:02) Insulin (units): Insulin Aspart Prandial Scale Pre-Meal 9 (12:49) | BG Values: 230 (17:22) Insulin (units): Insulin Aspart Prandial Scale Pre-Meal 6 (17:23) | BG Values: 221 (21:02) Insulin (units): Insulin Glargine Inj (Lantus) 14 (21:10) |
| 10/14/17 | BG Values: 170 (06:43) Insulin (units): Insulin Aspart Prandial Scale Pre-Meal 6 (08:24) | BG Values: 196 (11:28) Insulin (units): Insulin Aspart Prandial Scale Pre-Meal 6 (12:36) | BG Values: 131 (17:18) Insulin (units): Insulin Aspart Prandial Scale Pre-Meal 5 (17:29) | BG Values: 266 (20:37) Insulin (units): Insulin Glargine Inj (Lantus) 16 (20:35) |
| 10/15/17 | BG Values: 272 (06:40) Insulin (units): Insulin Aspart Prandial Scale Pre-Meal 8 (07:50) | BG Values: 310 (11:43) Insulin (units): Insulin Aspart Prandial Scale Pre-Meal 9 (12:33) | BG Values: 363 (17:19) Insulin (units): Insulin Aspart Prandial Scale Pre-Meal 10 (17:35) | BG Values: 108 (21:12) Insulin (units): Insulin Glargine Inj (Lantus) 20 (21:12) |
| 10/16/17 | BG Values: 247 (06:44) Insulin (units): Insulin Aspart NPO Correction 5 (07:00) | BG Values: 84 (11:46) Insulin (units): -- | BG Values: 439 (16:57) Insulin (units): Insulin Aspart Prandial Scale Pre-Meal 11 (17:33) | BG Values: -- Insulin (units): -- |
| Summary | Lowest BG: 170 Highest BG: 272 # Low (BG<70): 0 # High (BG>180): 3 | Lowest BG: 84 Highest BG: 390 # Low (BG<70): 0 # High (BG>180): 3 | Lowest BG: 131 Highest BG: 439 # Low (BG<70): 0 # High (BG>180): 3 | Lowest BG: 108 Highest BG: 266 # Low (BG<70): 0 # High (BG>180): 2 |

Summary

Alternatives to Basal/Bolus Insulin Therapy

Discuss Simpler Plans with Patient/Family

- Basal + Fixed Dose Meal Boluses
- Basal Plus (basal once daily + one meal bolus at largest meal)
- Pre-mixed insulin before breakfast and dinner, stress importance of eating meals on time
- Basal insulin once daily + repaglinide with meals
- Basal insulin once daily + DPP-4 inhibitor once daily
- Basal insulin once daily + SGLT-2 inhibitor
- Basal insulin daily and GLP-1 RA daily or weekly to cover prandial needs
- Basal/GLP-1 RA once daily combo: IDegLira (Xultophy 100/3.6) and iGlarLixi (Soliqua 100/33)

Diabetes Discharge Instructions:

University of Pittsburgh Medical Center (Donihi, AC; 2017)

Diabetes Discharge Instructions

Your diabetes provider is _____. He/she can be reached at _____.

Your follow-up appointment is _____ (date) at _____ (time).
Please call at least 24 hours in advance if you need to change this appointment.

CONTACT YOUR DOCTOR OR DIABETES PROVIDER IMMEDIATELY IF:

- You cannot eat or you are vomiting more than 1 time in a day
- Your blood glucose is above 240 mg/dl two times in one day
- Your blood glucose is less than 70 mg/dl two times in one day
- Your meter states "high"

If you are new to this provider and you do not have a doctor, call _____ if you have questions about your blood glucose or diabetes medications before your follow-up appointment.

The American Diabetes Association recommends that all people with diabetes see a diabetes educator after a hospital stay. You can call _____ to schedule an appointment.

Your A1C result is _____. The A1C measures your average blood glucose for the past 2-3 months. Diabetes is diagnosed when the A1C is 6.5% or higher. The goal A1C for most people with diabetes is less than 7%, but your goal may be higher or lower. You should ask your diabetes provider what your goal is.

You should check your blood glucose _____ times a day at the following time(s): _____.

Your recommended goal blood glucose range is: _____.

When you are ready for hospital discharge, but before leaving the hospital:

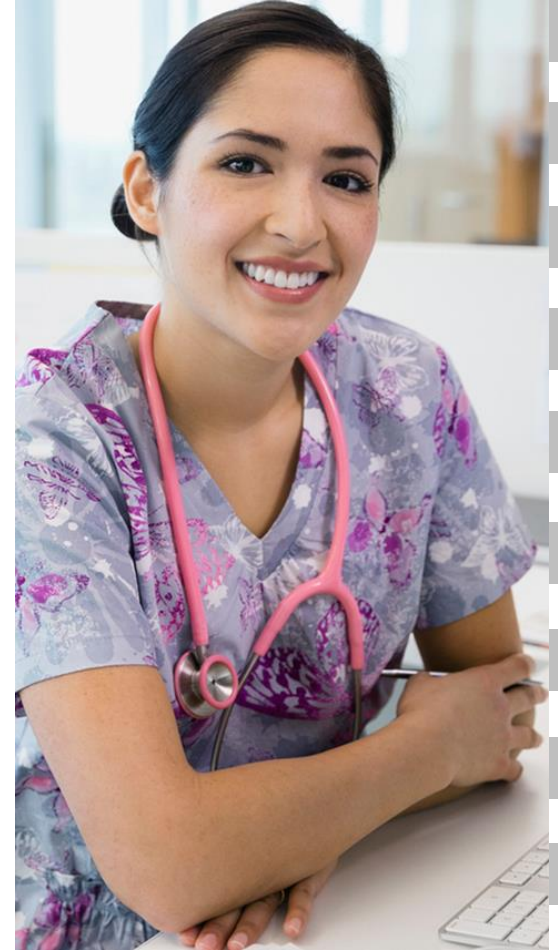
1. Make sure you have prescriptions for all new medications that you need to take at home.
2. If you do not have a glucose meter at home, request prescriptions for a meter, test strips, and lancets. Ask your nurse or pharmacist to show you how to use a glucose meter, if you do not know.
3. If going home on insulin, make sure you have a prescription for pen needles or syringes. Ask your nurse or pharmacist to show you how to administer insulin, if you do not know.

Diabetes medications that you will take at home:

| Name | Dose | When to Take | Possible side effects |
|------|------|--------------|-----------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Summary

- Identify high-risk patients
- Optimize insulin therapy during hospitalization to achieve glycemic targets
- Provide individualized diabetes self-management education, allowing for ample time to practice skills
- Develop a discharge plan that includes medication reconciliation of discharge prescriptions that considers patient access
- Consider current A1c, BGs and insulin usage during hospital stay in addition to patient preferences and ability to perform self-care when formulating a discharge regimen
- Consider planned follow-up phone calls and visits to review BG values and adjust medication doses post discharge



Selected References

- American Diabetes Association (2018). Standards of Medical Care In Diabetes- 2018. *Diabetes Care*: 41(Supp1); p.1-150.
- American Diabetes Association Scientific Statement. Economic Cost of Diabetes in the US in 2012. *Diabetes Care* 36:1033–1046, 2013
- Donihi, A. C. (2017). Practical Recommendations for Transitioning Patients with Type 2 Diabetes from Hospital to Home. *Current Diabetes Reports*, 17(7), 52.
- Dungan, K., et al., *An Individualized Inpatient Diabetes Education and Hospital Transition Program for Poorly Controlled Hospitalized Patients with Diabetes*. *Endocr Pract*, 2014: p. 1-24.
- Healy, S.J., et al., *Inpatient diabetes education is associated with less frequent hospital readmission among patients with poor glycemic control*. *Diabetes Care*, 2013. 36(10): p. 2960-7.
- Institute for Safe Medication Practices (ISMP, 2017). Guidelines for Optimizing Safe Subcutaneous Insulin Use in Adults. Available at: <http://www.ismp.org/Tools/guidelines/Insulin-Guideline.pdf>
- Rubin, D.J., et al., *Early readmission among patients with diabetes: a qualitative assessment of contributing factors*. *Journal of Diabetes and Its Complications*, 2014. 28(6): p. 869-73.
- Rubin, D.J., *Hospital readmission of patients with diabetes*. *Current diabetes reports*, 2015. 15(4): p.1-9.
- Rubin, D.J., Meneghini, L. F., Seley, J.J., Cagliero, E., Gaudiani, L. M., Gilden, J. L. Chapter 30 Transition of Care: Discharge from the Hospital. In *Managing Diabetes and Hyperglycemia in the Hospital Setting*. Draznin B, Ed. Alexandria, VA, American Diabetes Association, 2016.
- Umpierrez, G.E., et al., *Hospital discharge algorithm based on admission HbA1c for the management of patients with type 2 diabetes*. *Diabetes Care*, 2014. 37(11): p. 2934-9.
- Wexler, D.J., et al., *Impact of inpatient diabetes management, education, and improved discharge transition on glycemic control 12 months after discharge*. *Diabetes Res Clin Pract*, 2012. 98(2): p. 249-56.

Johnson & Johnson DIABETES CARE COMPANIES

For more information visit www.jjdi.com. **Become a member and opt in** to be notified about our new programs, publications and more!

Follow us on Twitter [@JJDiabetesInst](https://twitter.com/JJDiabetesInst) to receive timely and important updates about diabetes

Subscribe to our [YouTube](#) channel to view our clinical videos and webinar chapters