

Transition from Acute Care

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Glycemic Control Bootcamp
December 9, 2016

PRESENTER 1: OK. All right. So transitional care is a time of high risk, and I think taps into many other areas of interest, readmissions and population health. So I really think if you identify somebody who's got newly diagnosed diabetes, this is really an opportunity to promote years of health. So it's the blindness that never happens, the dialysis that's never required. So even if somebody is there with a different primary admitting diagnosis, this is your chance to catch a new diagnosis or optimize or intensify therapy for somebody who's not at goal, and again, taps into readmissions and population health, and your administration will be interested in that.

So transitions between hospital and home. You really want to know the story at home. What's life like at home? Who cooks the meals? How are you eating? Are you working full time and grabbing McDonald's on the run between meetings or are you able to eat regular carb controlled meals at home? What medications are they using at home? Are they adhering to the regimen? If they're not taking medication consistently, ask why. There's always a reason. It may not be a good reason or a logical reason, but there's always a reason. So be curious about that.

In the hospital, again, everybody goes onto an insulin regimen. You stop all the non insulin agents and we really have the opportunity to observe very closely what the requirements are. Just because you're on insulin in the hospital doesn't mean you have to go home on insulin. And you have to use the data you have to make a decision about what you're going home on.

Now, I will say before we dive into this, we're going to hear a little bit about some of the newer medications. There are so many medications and so many new agents being approved. I do think it's worth being familiar with all of those. We're not going to have time to dive into it too much in depth, but it might be good for a separate round table if there is interest in that.

OK. So prior to discharge, you want to look at the A1C. You want to know what the goal is for the patient. You have to take that into the context of the person's co-morbid conditions into consideration. So if you have somebody who is 90 years old and dealing with advanced dementia, an A1C of nine may be perfectly acceptable to that patient and their family. Whereas if you have a newly diagnosed type 1 diabetic who's 18 years old and heading off to college, you're going to want to be a little more aggressive with the A1C. For most folks, the goal is about a seven. But again, you have to really tailor it to your individual patient.

Think about new co-morbidities. If it's somebody who's coming with, for example, a new diagnosis of heart failure, that requires a lot of self care at home. You're really going to want to keep your regimen simple, because they're dealing with a lot. And also the idea of processing information when they're kind of dealing with so much in their life. And if somebody has come

and had some kind of insult to the kidneys, that really limits the number of agents that are available to you outside of insulin. So you really need to pay attention to those issues.

All right. So this really makes a big impact. Readmission rates for patients with and without diabetes. So diabetes is coded for 26% of adult hospital discharges, and readmission is 31% higher with diabetes. A lot of it is in the surgical population. So general surgery, 45% increase. And I think at our institution, this is where a lot of the need is. I think hospital medicine can consult on some of the more simple cases. But if we have endocrinology resources available, they could really be helpful.

And if you think about it, nobody in this room would want me as a second assist on a cabbage. Nobody wants me touching a scalpel. So why we're asking our surgical colleagues to manage this so actively, you really have to think about skill task alignment and are really asking the right people to do the job. But general surgery in particular is a big driver of diabetes readmissions.

So 30 day readmissions. No diabetes up to 13.5%, diabetes up to 22.7. The key risk factors for readmissions in this study are things that make a lot of sense. And you see that these are risk factors for morbidity and mortality in the health care system. I think what this really speaks to is the physiology of diabetes is dangerous and it really is the primary biology that increases the risk. Sure, you want to address all of these other risk factors, but the diabetes really is a primary driver. The physiology there really is the primary driver of readmissions.

So effective hospital discharge. You want to have an individualized inpatient diabetes self-management education. So what do I do when I'm not feeling well at home? What do I do if I have a high blood sugar or low blood sugar? You really want to spend some time educating that patient so they know how to deal with minor things that come up and don't immediately return to the hospital.

You need a mutually agreed upon discharge plan, which I think is really key. So I talked to my residents about in the hospital, people are kind of passive. They come there and I kind of do things to them. And I can make a blood sugar whatever I want. It's kind of like shooting at a bullseye.

But when you're discharging somebody, it's more like shooting a bird at a bullseye. So the bird has a mind of its own. You may set the trajectory and write the best discharge instructions and set everything up, but the bird's got a mind of its own. And you want them to land safely on the bullseye, then you really have to make sure that they're in agreement with your plan. So mutually agreed upon discharge plan is important.

Clear diabetes specific instructions that are given to the patient and can be hand carried to the next follow up. Recommendation for any hospitalized adult is follow up dedicated to diabetes within one month. That's in the 2016, relatively new standards of care from the ADA and AACE about transitions.

Accessible prescriptions for all necessary supplies and medication. And I really had no appreciation of how complex the insurance coverage for the different equipment and supplies

are. And there some work arounds about that. But just be aware of the complexity there and try to keep things simple and accessible.

Risk reduction strategies. So A1C result prior to discharge in order to guide the plan. So as soon as they're admitted, make sure you've either had a value drawn recently or get it done on admission. I think most places recommend within 60 days at our hospital. We have an alert. If the A1C is older than 30 days old, we ask people to redraw it. About 50% of the A1C value comes from the last 30 days, so we feel like that's most relevant.

Medication reconciliation. The more robust you can make that process, the more you can reduce risk. I know some institutions involve a pharmacist at bedside. There are some meds to beds programs. The outpatient pharmacy will actually deliver medication and supplies to the bedside so that everybody can look and touch and feel and see that it's going to happen.

Follow up call and appointment scheduled for next visit post discharge. So scheduling your appointment prior to discharge increases the show rate. Transportation assistance to appointments. For some folks, that's an issue. Greater use of home care, meal assistance, ongoing diabetes education, and care coordination. So even if you don't have an endocrinology clinic locally, there are support groups or online resources or other things that you can direct the patient to that may be helpful.

So education. The ADA recommends education on the survival skills for every diabetic every admission. The five survival skills basically relate to blood glucose monitoring, self-care, and sharps disposal. And the use of a certified diabetes educator has been shown to reduce readmissions and improve hemoglobin A1C sustained after discharge.

And I came across these articles are listed at the bottom there. I came across those in preparation for a recent improvement project we had called the state proofing discharge of the diabetic patient. We looked at the standards of care document that came out this year from the ADA and did a little bit of a gap analysis, looking at what practices we have in place and where we had holes. And we had lots of opportunities based on that gap analysis.

So I marched that gap analysis around to patients, nurses, outpatient providers, and asked them to pick their top three that they felt would be the highest yield or were the biggest rock in their shoe. And the targets that we came up with were one, education, two, follow up, and the lead time between discharge and time to appointment with a dedicated diabetes provider, whether it's your primary care doctor or an endocrinologist. And then and making sure that we had supplies and meds available. So those were the three targets for our improvement project. And my reading really made me want to hire a CDE, which we do not have. But if you have spare money laying around and you're looking to hire somebody, I would hire there.

So here's what we came up with for our five survival skills. And we have an order. It's precheck in all of our insulin order sets. And it's lock checked, so they can't uncheck it. I mean, this is similar to our approach. We like a lot of force functions. You have to order insulin through our evidence based order sets. Our safety things, like rescue dextrose and our education, our precheck, and lock check.

So every diabetic admitted to our hospital gets this education, starting from the time insulin is ordered and it's tasked to our nursing colleagues. It's tasked every day around noon. So we'll see how this goes. It's pretty new. We just published this form in October. So stay tuned.

And we actually engaged patients in this work. So I had two patient partners on my team, which was really interesting. And one of them was like a black belt in Six Sigma training, so she knows a lot about quality improvement, which was a little bit intimidating. But she had some really great input and they really simplified the language and they really were insistent about getting it down to one page.

And this traffic light tool, it's very simple. If your fasting blood sugar is about 100, you're OK. If your fasting blood sugar is greater than 200, you need some attention. If your fasting blood sugar is greater than 300, you need to be seen. As an inpatient provider, the idea of allowing a fasting blood sugar to land on 300 was really anxiety provoking to me. But when I talked to my outpatient colleagues, the volume of phone calls it would generate to set these thresholds any lower would be not manageable.

So this is a mutually agreed upon tool. Our outpatient clinics hand this out. It was a really a neat improvement project to try and have a shared mental model about what's urgent, what's important, and what's OK. So we'll see how this goes.

Supplies. So again, that can be complex, particularly when it comes to coverage. I didn't realize prior to this event that actually people can buy lancets and test strips without any prescription. You can go on Amazon Prime and order yourself some lancets if you like, anyone in this room. No prescription necessary. But some insurances do cover the supplies and which lancets and which test strips are very insurance dependent.

So the key is to write kind of brand not medically necessary, and then the patient can work with the pharmacist and their insurance to figure out what's optimal. And for some patients, the finances are not a particular barrier, so they may want a more comfortable meter that happens to be a little more expensive. That's fine. They can work it out amongst themselves. But if you write brand not medically necessary, it allows a little flexibility. And that was something that was coming up over and over with our patients.

So this is our kit for the newly diagnosed. We have a one page teaching document in there very similar to the one I just showed you. We offer a glucometer. We have sugar packets, lancets, and test strips. These are, believe it or not, assembled by volunteers at our hospital. The meters are donated by different pharmaceutical representatives, and therefore tend to be the newer models, and therefore more expensive. So that's why we write a prescription for new glucometer discharge, because it may be cheaper to buy a glucometer and have coverage for the test strips and lancets.

So this is for newly diagnosed, and it really speaks to just blood glucose monitoring. An area where we could stand to improve is the business of teaching insulin administration. And I think that that's really where a CDE could come in handy. We just have a booklet and a video. And the most important thing is to allow the patient to self inject. That's how they learn. There are safety

issues with the Pyxis and pulling the insulin out of the Pyxis and do you allow pens or do you not allow pens, and it's really complex work, but I think maybe next in our iteration of education.

When you're prescribing pens and lancets, you want to think comfort. You want them to use things consistently. Be careful about which needle you're selecting and how long. So that's a bit on education and supplies.

Medications. So again, in the hospital, we use insulin and insulin and sometimes insulin. So pretty straightforward. And then when they leave the hospital, there's this whole menu of options. And it may make sense for your patient to use one of them. So you should be familiar with those medications. And you need to know when to intensify therapy.

So again, your A1C is your best guide for this. Sometimes patients in the hospital have been transfused or the A1C is otherwise unreliable. But you have blood glucose data, which is actually more detailed. The A1C, again, is just an average. But if you have a good A1C, you can use that to drive some decisions.

So A1C less than seven without any significant hypoglycemia, you can return to the home regimen, assuming no new contraindications. Between seven and 10, restart the outpatient oral medications, optimize orals, and consider adding basal insulin. And if they're over 10, resume outpatient orals, add basal insulin.

So this is from UCSD. Ours is similar. Our threshold for intensifying therapy is an A1C of eight. That is the publicly reported number for our outpatient colleagues, as those patients with A1C greater than 8 are out of control. So that is the threshold that we use. Also just because many patients in the hospital have a number of other active medical issues. We don't want to complicate things too much.

And then also, again, consider the context of your patient's co-morbid conditions. And their goal may be a little different. So if they're dealing with a terminal malignancy or other life limiting illness, it may be OK to let the A1C drift up a little bit.

So the diabetes med timeline here in the US. So just to point out. I finished residency here. And I've heard of these things. But yeah, we have a lot more insulin analogs. We've got oral agents, agents that act at multiple different sites. So there's more flexibility than there has been in the past. Again, there's lots of different sites of action. And you can really tailor to your individual patient's needs.

So ABCDs of choosing a med. So age and A1C. Is it at goal? How old are they? Risk of hypoglycemia goes up over the age of 70, so just be aware. Body weight and BMI. Somebody with metabolic syndrome, they're very resistant. Is it somebody who is thinner?

Cost and coverage, co-morbidities, complexity. That's a big one. So if you send somebody home on this really slick regimen that allows for lots of adjustments that's very flexible, if it's really complex and they're not understanding it, it's not going to work out. So think about that.

D, defect and duration of diabetes. So how long have they been dealing with diabetes? If it's a new diagnosis, you may want to be a little more aggressive again. S, side effects and safety profile. So renal insufficiency is a big country indication to multiple agents, Hepatic insufficiency and heart failure are the co-morbid conditions you really need to look out for.

So this table, I think, at first gave me some palpitations. But I love it now. So this is for type 2 diabetics, because if you're type 1, you're married to basal bolus. You need at least four injections per day. First line for type 2 is metformin. We don't use it in hospital.

So if you have somebody who comes with a new diagnosis of type 2 and the A1C is eight, you may be able to get away with just your first line therapy, just metformin, and they don't need any of the insulin at home. You do still need to have them monitored once in a while, and you're going to want to send them home with prescriptions for meter, lancets, test strips.

So first line therapy, metformin. After that, you can at any one of these agents. Some of the more potent agents are sulfonylurea and GLP 1 receptor agonist. Once you get into triple therapy, insulin is in every single choice. So insulin is 90% of the time is going to be required. Once you reach triple therapy, you're going to need at least a little bit of insulin. Or translating to A1C, once your A1C is in the double digits, insulin's got to be a part of the routine.

Also, how many of you have come across some of the new concentrated and extended formulations of insulin? Anyone see a patient? So U-500 I heard about, that we're seeing U-500. There's actually kind of a small community of patients that are on U-500, I guess, in the cystic fibrosis patient population. They can be pretty resistant. And so there is a cystic fibrosis clinic in the Seattle area, and some of those patients when they come in, we find them on U-500. The other one I've seen recently is degludec, which is apparently a 36 hour insulin.

You should just be aware of these names. I've seen providers try to order these medications without even knowing what they are, just continuing the home regimen, not even realizing that this isn't insulin. So I think there's a lack of awareness about these agents. And you should think about what kind of approach you want to take with this.

So our pharmacy has recently decided not to use any extended or concentrated formulations of insulin. We used to offer U-500 and we had standard work around ordering that and verifying the dose, and we were just dispensing it in a tuberculin syringe and having the pharmacist verify it bedside, but it's not gone well, so we're just going to convert everybody to our formulary, which is glargine and lispro.

So just be aware that these are out there. Make up your mind about how you want to handle it. Standardize your approach and see how it goes. I guess our rationale for offering the U-500 and not the others was U-500 is for very resistant patients typically requiring 200 units or more per day. And we thought, well, they've obviously landed on U-500 somehow, and so would lantus really work?

But nine times out of 10, they've landed on U-500 because of dietary sort of indiscretion. And when they're in the hospital and eating a carb controlled diet, the requirements come down so much that they really don't need the 200 units, so we just put them on the weight based protocol.

So initiating and intensifying insulin, different discharge regimens. So we, again, really try to keep it simple so that you give the patient best shot of adhering to it. That's kind of our philosophy. We start with basal alone, which is nice. It's one shot per day. I do see in our community that there's a tendency to sort of rely on monotherapy with glargines, and we'll really kind of hammer on that dose.

We're approaching too high a dose and you get that, I call it LOL, lots of long acting, or the glycemic retag. So every time they fast they crash down. So up to a point, one shot per day is adequate. But if you're using one shot per day to meet your nutritional needs, you're going to run into a problem. So sometimes patients just need more than one injection.

So basal plus is a regimen where you'll give a long acting insulin and then before the largest meal of the day, kind of give a one slug of short acting. Or you can do two shots a day with a combined insulin. So a 70/30 or 75/25 insulin. This works well for patients who are home and eating on a consistent schedule and do the same thing kind of every day, because the insulin is mixed. It's not very flexible as far as adjusting for different oral intake or things like that.

The full complement of basal bolus therapy is four shots per day. And then you can further add flexibility or make things more complex by making doses adjustable. So some patients are capable of carb counting, some patients could adjust for blood glucose. I tend to send my patients out on fixed doses. And then as they get used to the routine, they can fold in the different options to increase flexibility. But I try to keep it simple.

And then this is a nice figure sort of talking about the trade offs. So basal insulin only. One injection, which is nice for patient comfort. Low complexity, which is nice. But if they physiologically need more insulin to meet their nutritional requirements, you're not going to have ideal control.

Basal plus or pre-mixed insulins, two shots per day. It's a little more complex. But particularly the pre-mix is in fixed doses, so it's pretty straightforward. And it gets you pretty physiologic control. If you want to match physiology exactly, it's three or more injections per day. It's pretty complex, but you're matching the physiology most closely there. That's your best opportunity for the tightest control. So keep this in mind.

I do think it's useful to be aware of sort of the prescribing patterns in your community or what the general approach is in your outpatient clinics. So Virginia Mason is nice because we're kind of a closed loop system, and many of our patients have a primary care provider or endocrinologist within the system. And they have pretty robust standard work around how they initiate and titrate insulin. And these kind of protocols are pretty common. So if we're starting NPH insulin, I think we just start at 12 units and just increase every couple days.

Same with glargine. I think glargine is more physiologic than NPH. NPH has a little bit of a peak, but there are some more recent coverage issues with glargine, so some patients have to be on NPH because of coverage issues. But this is fairly simple, and you can see in the ambulatory setting, titrating an insulin regimen may take weeks or a month, maybe even six weeks to really get to goal. You really have the luxury in the hospital of watching very closely what their insulin requirements are. But again, just good to be aware of kind of what your community's approach to initiating insulin or initiating any diabetes therapy in the outpatient setting is.

And outside of insulin, I know that, again, just per guidelines, our first line therapy for type 2 is metformin. And then we fold in a sulfonylurea. But beyond that, our protocols are all insulin. So we're not using a lot of them. Not many providers in our community are using a lot of the newer medications.

So planning a safe and effective discharge. You have to convert your inpatient regimen into a safe outpatient regimen. Use of A1C during and after the hospital stays. So the A1C is you, again, a good tool for a decision tree about how you're going to craft your perfect discharge regimen. Consider lifestyle, diet, and activity. That makes a big difference.

Does anybody know how many points can you drop your hemoglobin A1C with diet and sort of exercise alone? One to two. One to two. And actually for some people, that will cure them of diabetes. So don't underestimate the impact of that. For some patients with the right personality, having the ability to control that without taking meds is really empowering to them. So if you identify in your patient that that's something that's important to them, you take the opportunity to capitalize on that.

So risk of hypoglycemia. So patients with, again, you got to look for co-morbid conditions, particularly renal insufficiency. I actually had a patient that went to our inpatient high intensity rehab unit and I thought, well, it's kind of more ambulatory. So I'll give the sulfonylurea back. A1C was OK. But they didn't like the food over there, and so he had mild hypoglycemia over in our inpatient rehab. So think about it.

Individualized glycemic target. So again, what's your patient's goal? And key barriers to consider. Costs of meds, ability to perform self-care. I've had patients with rheumatoid arthritis and big bony deformities or visual impairments. Then you may need to do or prior auth for a pen needle because they can't pull up on a syringe. So just think about those kind of things and resources.

So again, just revisiting. So effective hospital discharge. Individualized inpatient diabetes self management education. So education is key. I think keep it simple, repeat it. Mutually agreed upon discharge plans. So your patient has to really believe in the plan that you've created for them and agree to it and agree to participate. And

It's almost like a contract more than a care plan. Care plan sounds like something you hand to somebody and this is what we're going to kind of do with you or do to you or for you. This is more like a contract where you really want them engaged and want them to buy into what you're crafting as far as a discharge regimen.

Clear diabetes specific instructions. So I really like our little traffic light tool that we came up with. If I'm sick, what do I do if my blood sugar's high? If it's low, what do I do? Clear instructions. If this, then that. Simple language. And follow up with a dedicated diabetes provider, whether it's PCP or endocrinologist. And actually, one interesting thing is that a fair number of nephrologists will take care of diabetes in the Seattle area, because those patients are on dialysis and they manage everything. So important to know who is caring for the diabetes.

Make sure the prescriptions are accessible. If somebody is new to diabetes, I really like to have them go over to the pharmacy and make sure that we run the insurance, make sure that everything is adequately covered, that they have financial access to what I prescribe, that there are enough pills in the pharmacy to make sure that everything is there and tidied up before they walk out the door, ideally.

Order sets can be very helpful. So again, just the medications, of course. But I think particularly for hospital based providers, having some of the supplies and test strips. Because we really are blind to sort of what's available on the outpatient side. So in our improvement work over at VM, we had both an inpatient and an outpatient pharmacist helping us to select the kind of default order sentences so that they defaulted to the most commonly used equipment and most commonly covered.

We have some cases. So case number one. A 45-year-old man admitted with pneumonia. He's also found to have a new diagnosis of type 2 diabetes. He's been symptomatic with two months of polyuria, polydipsia, and unintentional weight loss of 20 pounds. His A1C is 10.7. So he's safely in the double digit range. Well, I shouldn't say safely. He's over 10. His creatinine is normal and his BMI is 30.

What is the most appropriate initial treatment regimen? Lifestyle, metformin. Any votes? OK. Lifestyle metformin and DPP IV? Lifestyle, metformin, and basal insulin at 100% of the inpatient dose? Lifestyle plus bolus insulin according to pre-meal blood glucose and basal insulin at 75% of inpatient dose. OK, I sold D to a couple.

So these are more for discussion. It's not absolute. I think you could potentially discharge this patient on full complement of basal bolus therapy. It's very aggressive. The regimen is complex and the bolus insulin or the nutritional insulin, you're asking that patient to adjust based on pre-meal blood glucose. That's a lot of new stuff to do for somebody who's just getting out of the hospital.

So I think another reasonable, more simple option might be C. So lifestyle modification, therapeutic lifestyle changes, which I like to refer to as TLC. So a little TLC, metformin, and basal insulin at 100% of the dose. Assuming he's not had any fasting hypoglycemia in house. So I would favor a more simple approach. Either one is reasonable. We take care of some Boeing engineers and they like spreadsheets. So if you get somebody like that, they may want.

So case number two. 56-year-old man with long standing uncontrolled type 2 for 15 years. He's got CAD. He's had an MI in 2003. He's got class IV heart failure, so bad heart failure, short of breath at rest, and sleep apnea. He's on metformin 1000 BID, glipizide 5 milligrams BID, and his

A1C is 10. His creatinine is 0.6 and his weight is 95 kilos. Which of the following medications should be added next?

So basal insulin once daily at half the inpatient dose. Basal insulin once daily at 100% inpatient dose. GLP 1 or DPP IV. Yeah, I think he's earned insulin at this point. So I would favor B. Anything you do is going to help. If you give him 50% of the inpatient dose, he's going to be better off than when you met him. But observed him closely in the hospital over time, and barring any fasting hypoglycemia, he ought to be OK on 100% of the inpatient dose that you were using. So it would be OK. And I would favor B, but either A or B are reasonable. Christy, did you want to comment on adding a GLP 1?

PRESENTER 2: Again, it all depends on the negotiations that took place with your patient and what they are willing to do. Maybe his weight. The GLPs are going to be more weight neutral or weight loss compared to adding your basal insulin. And again, don't ever forget about lifestyle. You can have a significant impact on your A1C with lifestyle. So I always, always, always discuss beverages at least with patients. And if they can switch to all 0 carb beverages, that's a good 1%. So if he's willing to switch to 0 carb beverages, maintain compliance with the orals, you might be able to get away with a GLP 1, especially because they do come in once weekly form that can really, really help with compliance.

PRESENTER 1: So the question was, what should we add? You could potentially take away some of these. And in somebody with class IV heart failure, if this is their maiden voyage in the hospital and the first time we're meeting them for heart failure, that's one story. But if this is somebody who is admitted every 14 days for heart failure, metformin is probably not a good choice.

PRESENTER 2: And a lot of it depends on that renal function, even with the heart failure. Because it's the heart failure that's going to put them at higher risk for AKI or cardio renal syndrome. Those are the ones that you're going to take off metformin. But if this guy is cruising along with a GFR greater than 60, I don't touch it. That's one of our most powerful medications, weight neutral.

PRESENTER 1: And everybody, I think, has probably heard that now you use a GFR to make your decision about metformin as opposed to the creatinine, which makes more physiologic sense. So I believe the cutoff is 30.

AUDIENCE: I'm just thinking of cardio-detective effects on the GLP ones. Could you also just do the basal insulin and the GLP 1 and take him off the glipizide?

PRESENTER 2: For sure. You can even just leave the glipizide on there and add all of it. Yeah, you can do it. The only time I would ever take a patient off of glipizide has a lot to do with your risk of hypoglycemia. I take it off all the time. But in this case, if I have a guy who is nowhere close to hypoglycemia and requiring quite a bit, I might add my GLP, keep the glipizide, and just do a lower dose of basal. Because I always try to also give them hope that with implementation of these lifestyle adjustments, we can peel off.

Insulin isn't necessarily a life sentence. But I'm pretty aggressive when I discharge patients from the hospital, because usually they're there with a wound that is healing and we don't have six months for them to try to make some changes. I need immediate glycemic control for wound healing and then we can peel off.

PRESENTER 1: Yeah, I like to add insulin up front. Just psychologically, it feels better to later remove the insulin than to try other different things. And if it doesn't work out, then you put the insulin on board, then feels more sort of punitive and like a therapeutic failure.

PRESENTER 2: And they get discouraged by going home and having high blood sugars. So a lot of patients are like, wow, I've never seen sugars in the 100s. I can't believe you were able to do that here in the hospital. And so they are more encouraged just to stay on the wagon if they can actually see blood sugars in the 100s at home rather than being like, oh, that's only something they can do in the hospital. This is not possible to achieve that at home.

AUDIENCE: [INAUDIBLE]

PRESENTER 2: Yes, he does. The only problem with SGLT 2 is they're not on the list. But they're not near as powerful as your insulin or your GLP.

PRESENTER 1: It's not going to get them to goal.

PRESENTER 2: It could absolutely be an option, especially if he's got recurrent admissions for heart failure. Love them.

AUDIENCE: [INAUDIBLE]

PRESENTER 2: Not usually with heart failure. Usually the cardiologists love it because of all the data that's come out with the SGLT 2's. But yes.

AUDIENCE: [INAUDIBLE]

PRESENTER 2: True, true. Absolutely.

PRESENTER 1: The SGLT inhibitors, we didn't talk much about the front end and transition into the hospital, but there is a clinical phenomenon called glycemic DKA. And the way these SGLT inhibitors work is by kind of excreting glucose through the urine. So one, there is increased risk of recurrent refractory sort of UTIs because of the glucose urea. But two, if somebody otherwise finds themselves in a DKA type physiology, it may be masked because they'll lose the glucose in the urine.

So there's a case series and it's happening in patients with type-- so more than 90% of the cases are patients with type 1 diabetes who are using this medication off label to help with the glycemic variation. So if they've got a little spike, they'll urinate off that extra glucose.

And there's data. There's a flat sugar trial, that suggests that glycemic variation is hard on the body and people who are very label will have worse outcomes. So people are targeting glycemic variation as an intervenable thing. And so we're using this medication off label in type 1's. Think about euglycemic DKA.

And we've seen it twice in our hospital. One was a type 1 diabetic patient on a pump who was on a cruise ship and picked up a souvenir from the cruise ship, a little norovirus. So she knew she wasn't feeling well. She'd adjusted her pump and decreased her insulin, but kept taking her SGLT 1 inhibitor and came in DKA with a pH of like 6.9, and her blood sugar was 200.

And then the other scenario is a type 1 diabetic who's been told, for better or for worse, to kind of cut down on their basal insulin the night before an elective surgical procedure. They keep taking this medication, so they've cut down their insulin, their basal insulin, which as a type 1 you need even when you're in PO. So their blood sugars go up, they pee them off, and they're presenting.

And the way this left was I got our consult for somebody in the pre-op area and she's just kind of throwing up and kind of felt unwell and had a little bit of a gap, but a normal blood sugar. So it took us a while to figure it out. In the meantime, we just ordered fluids and Zofran and then checked for ketones and she had ketones. So it's type 1 who's cut their basal insulin for whatever reason still taking the SGLT 1 and kind of feeling unwell with an unimpressive hyperglycemia but a gap. Think about this.

So case three. 75-year-old woman with longstanding type 2 diabetes and osteoporosis. Recently admitted to the hospital with a hip fracture. Status post, a fall at home in the setting of hypoglycemia. So 75, age over 70, risk of hypo is higher. She's on metformin one gram twice a day and glimepiride two milligrams a day. Her A1C is 6.5 and her creatinine is 0.4 and she's 40 kilograms.

Which of the following medication adjustments is the most appropriate? One, no change. Her A1C looks beautiful. Stop glimepiride and start a DPP IV. Stop metformin and start an SGLT 2 inhibitor. Stop glimepiride. How many for A, B, C, or D?

I think D is fine. Less is more as far as getting somebody to stick with their treatment plan. And her A1C is below goal and she's had hypoglycemia. So I think you can just let the glimepiride go. I heard a couple votes for B. If her A1C were a little bit higher and she were a little bit younger, I think maybe that's debatable. But always the safer thing would be to let her blood sugars kind of drift up, and if she's high, then add a medication. So I think D is probably the best answer here. Questions on this one?

PRESENTER 2: Yeah, I would say D or B as well. The DPP IV's are pretty safe. They're not very strong. I kind of refer to that class as a step above water. They don't do a lot for your sugar control, but they also don't come really with any side effects or contraindications. You can use them all the way down to-- pardon?

AUDIENCE: [INAUDIBLE]

PRESENTER 2: So this one, it's not very powerful, but if you need a little something, it works really well in this patient population.

AUDIENCE: [INAUDIBLE]

PRESENTER 2: Yeah, absolutely. It's definitely an answer that is very reasonable.

PRESENTER 1: OK, so key points. Excuse me. Effective plan for discharge can reduce hospital readmissions and promote years of health. Don't forget about people who don't know they have diabetes. That's a real opportunity.

Critical elements include education, follow up, and medication management tailored to the individual patient in front of you. You really want to get their buy in, so make sure it works for them. Protocols and orders can help to standardize and improve care across the continuum. So if you have the opportunity to engage with your outpatient colleagues, I think that that can really help with kind of closed loop communication and a standardized approach and a consistent message across the health care setting. So those are some of my thoughts. Questions?

AUDIENCE: You talked about a one-month follow up as being the--

PRESENTER 1: The recommendation.

AUDIENCE: And I think for a lot of the patients I see in the hospital, they are going to be changing. Their condition, their activity, their diet are going to be changing maybe fairly acutely. And I don't always feel that what they're needing in the hospital is what they're going to be needing at home. And I just feel like if they have to go a month, I'm not sure it's considered safe.

PRESENTER 1: It's within one month. So three days is less than a month.

AUDIENCE: Right. That would be better.

PRESENTER 1: I don't know how it is in your system, but for us access can sometimes be an issue, particularly if it's somebody who's not established with anyone and it's new patient hospital discharge. That's your highest risk scenario. But the recommendation is within a month, but certainly some patients would really benefit from multiple visits within the months.

AUDIENCE: Right, especially if I'm sending them out on a complex regimen that they've never used before.

PRESENTER 1: Yes. And there's phone call follow up too, if access is an issue. Don't forget there are care managers or others that can be engaged here.

AUDIENCE: You already answered it, thank you.

PRESENTER 2: Anybody else? So I'm thinking a quick five minute break so people can run to the bathroom real quick. I know that we all would love early dismissal.