NATIONAL GUARD HEALTH AFFAIRS

Quality & Patient Safety Newsletter

A QUARTERLY PUBLICATION OF THE QUALITY & PATIENT SAFETY COUNCIL VOLUME 6 / ISSUE 1 / March 2014

IN THIS ISSUE

ABOUT THE NEWSLETTER

"By providing important and relevant information to healthcare providers, this Newsletter aims to enhance communication of quality and patient safety information, raise awareness of reported adverse events and maintain ongoing link to all the medical departments of the Ministry of National Guard Health Affairs (NGHA) facilities. "

BUILDING SAFER CARE:
Leadership & Organizational Priority

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Insulin Injection Technique

Ms Tracey Jane Clay MSc Diabetes RGN, Nursing Supervisor Diabetes Program , Nursing Services Center of Nursing Education, KAMC-R

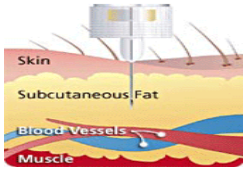
Saudi Arabia is one of the top three countries across the Middle-East and North Africa regions with the highest prevalence of diabetes[1]. With the anticipated exponential growth comes the need for effective and safe practice of insulin administration within the hospital environment.

Insulin is given as replacement therapy in people with absolute (Type 1 diabetes mellitus) or relative insulin deficiencies (Type 2 diabetes mellitus) and is the main injectable option to treat diabetes. A balance must be maintained between carbohydrate consumed, insulin administered and exercise taken - all of which can affect blood glucose concentration. The aim of treatment is to maintain near normoglycemia. Self-monitoring of blood glucose and regular HbA1c measurements are necessary to ensure that treatment is effective and that individualised targets are being met.

Administered by subcutaneous or intravenous injection, insulin products are frequently involved in medication errors in hospitals, and are classified as High Alert Medications; insulin medication errors have the potential to result in serious harm, including death. In an effort to promote the safe use of insulin, a consensus document of practical recommendations for enhancing insulin-use safety in hospitals was published by the American Society of Health-System Pharmacists (ASHP)[2]. The ten recommendations for safe practice are detailed in Appendix 1.

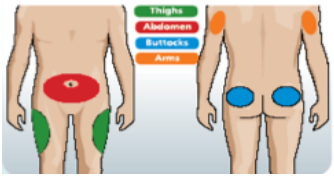
This article focuses on elements of the seventh recommendation for safe practice and is aimed at improving diabetes outcomes by standardizing education practice and effective administration of insulin injection therapy.

Insulin absorption



Injecting insulin at the correct depth is an important element to good technique and optimal absorption. For the most efficient absorption and utilization, insulin should be injected into subcutaneous fat. Injected too deeply, the insulin can enter into the muscle, accelerating absorption and increasing the risk of hypoglycemia. If the injection is not deep enough, the insulin may leak out, reducing its effectiveness.

Sites for injection

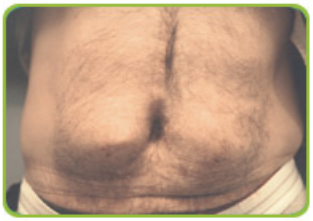


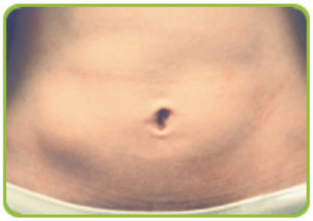
Sites for subcutaneous insulin injections include the upper arms, upper thighs, abdomen and buttocks. Absorption is fastest with injection in the abdomen followed by arms, thighs and buttocks. The area within a two-inch radius of the umbilicus should be avoided.

It is normal for a small amount of blood to occasionally appear when insulin is injected and is usually caused when the syringe punctures a tiny blood vessel.

Site rotation

A common consequence of inadequate rotation is lipohypertrophy and reported to occur in nearly 50% of insulin using individuals.[3] Lipohypertrophy has also been linked to poorer glycemic control and reduced insulin absorption.[4,5] These lumps under the skin at the injection sites are often easier to feel than to see but in some patients over time become large; rotation of injection site is critical to preventing lipohypertrophy.





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Needle usage

Needle lengths are available in different sizes, the 4,5 and 6 mm needles are suitable for all patients with diabetes irrespective of BMI; a skin fold lift may not be required when using a 4 mm needle. To increase comfort, the width of the needles has been made smaller, requiring the walls of the needle to be thinner; short and narrow gauge needles have been reported to reduce pain in children and adults.[6,7,8] These thinner walls are strong enough for single-use, but not for repeated use. A reused needle does not inject as easily or as cleanly as a new needle and can cause pain, bleeding, and bruising. The tip of a reused needle can even be weakened to the point that it breaks off under the skin therefore the reuse of needles or syringes are not recommended. Moreover, the risk of needle stick injury to healthcare professionals is great and needles should never be re-sheathed[9].

Storage of insulin

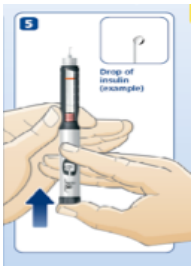
Insulin should be stored in the refrigerator between 2º C - 8º C as per manufacturer's instructions. A visual inspection of the vial and cartridge should be made prior to administration to ensure there are no changes in the insulin e.g. clumping or altered clarity that might indicate loss of potency.[10] Dosing accuracy is paramount in insulin administration and research suggests that the use of pen devices are more accurate than the use of a syringe when delivering doses below 5 units, but have comparable accuracy with doses above 5 units.[10,11,12] There are various documented benefits for the use of insulin analogs and pens including the potential for dosing error reduction and subsequent cost effectiveness. [13,14]

Tips for injecting

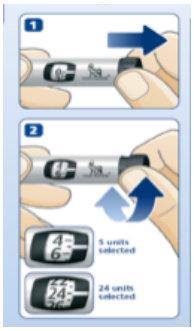
- Wait until the alcohol from the swab has dried completely on the skin before injecting.
- Inject at a 90° angle using a short needle.
- Penetrate the skin quickly.
- Inject slowly and ensure the plunger has been fully depressed.
- Inject the insulin when it is at room temperature.
- Never use the needle more than once.
- Do not inject through clothing.

The instructions below are an example of an injection procedure, when using a pen device.

Setting the Dose

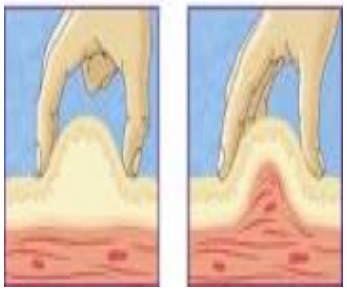


Check that the dose selector is set to zero.
Prime the needle using a two unit air shot.



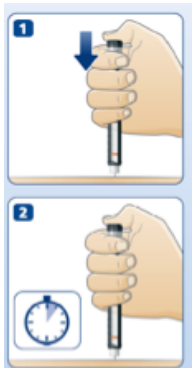
Dial the number of units needed to inject.

Create a skin fold



Lift a fold of skin between the thumb and index finger. Keep this skin fold up during the whole injection process.

Injecting



Insert the needle into the skin. Keep the push-button all the way down after the injection until the needle has come out from the skin. The needle should stay under the skin for 10 seconds.

Remove the needle and dispose of the sharp as per hospital Administrative Policy and Procedure.

There are a number of organizations at international and local levels moving to develope new guidelines for safer practice of insulin administration, this short article hopes to pave the way to standardizing education practice within National Guard Health Affairs.

Appendix 1

Prescribing

1. Develop protocol-driven and evidence-based order

sets for specific uses of insulin such as transition of administration route from intravenous to subcutaneous, administration via implantable insulin pumps, post-discharge dosing, diabetic ketoacidosis, hyperosmolar states, hyperkalemia, and post-cardiac surgery care. These order sets should include orders for glucose monitoring and decision support capabilities that guide insulin use based on the patients' nutrition status. In addition, protocol driven and evidence-based order sets for the management of hypoglycemia should be developed and integrated into the care of all hospitalized patients who receive insulin.

2. Eliminate the routine administration of correction/sliding scale insulin doses as a primary strategy to treat hyperglycemia.

3. Eliminate the use of "free text" insulin orders in electronic and paper medical records and replace them with protocol-driven and evidence-based order sets that allow for the prescribing of complex insulin regimens.

Dispensing and Storage

4. Store only U-100 concentration insulin and U-100 administration devices (e.g., syringes, pens) in patient care areas and ensure that they are stored in a secure fashion and segregated from other medications.

5. Develop hospital-wide standard concentrations for insulin infusions to be adopted and used in all patient care areas.

Administering

6. Limit preparation, including for procedural areas, of all intravenous bolus insulin doses and intravenous insulin infusions to the pharmacy department.

7. Hospitals must develop policies and procedures to ensure that insulin pens are used for individual patients only. In addition, hospitals must establish policies and educational programs to ensure the safe use of insulin pens and disposable needle tips.

Monitoring

8. Ensure that insulin use is linked directly to patients' nutrition status. Meal delivery, point-of-care glucose testing and insulin administration should be well-coordinated and standardized. Patients and their family caregivers should be educated to request administration of rapid-acting insulin when the patient begins her/his meal. In patients with variable nutritional intake, insulin administration should be delayed until completion of the meal. Protocol-driven and evidence-based order sets should be developed for insulin use and blood glucose monitoring during planned and unplanned interruption of enteral nutrition or total parenteral nutrition.

Evaluating

9. Every hospital should prospectively monitor/measure rates of hypoglycemia and hyperglycemia; insulin use; and coordination of insulin administration, glucose testing and nutrition delivery. Realtime, institution-wide glucose reports should be provided to health care team members to ensure appropriate surveillance and management of patients with unexpected hypoglycemia and hyperglycemia.

Planning

10. Provide standardized education, including competency assessment, to all hospital-based health professionals who are responsible for the use (e.g., prescribing, compounding, dispensing, administering, monitoring) of insulin.

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KING ABDULAZIZ MEDICAL CITY—WESTERN REGION
KING SAUD BIN ABDULAZIZ UNIVERSITY FOR HEALTH SCIENCES
JEDDAH, KINGDOM OF SAUDI ARABIA

Patient Flow in Emergency Department

Be Innovative. Be Simple.

Ahmad M. Wazzan, MD, SBEM (HON), ArBEM
Assistant Professor, Consultant Trauma & Emergency Medicine

Context

This project was initiated in the Emergency Department of King Abdulaziz Medical City, in Jeddah, Kingdom of Saudi Arabia. It is a 30-bed Emergency Department (ED) with annual visits of 50,000 patients.

Problem

The long waiting times in our department is considered a major problem that was noticed by the staff, department administration as well as the organization executives. These times include time to doctor, time to disposition and overall ED stay.

Decreasing patients' satisfaction was continuously noticed (in the form of increasing complaints, increasing "Left without being seen" rates). Moreover, staff dissatisfaction was going uphill. The increasing number of ED boarding patients, which is a hospital-wide problem, is considered a major cause.

Assessment of Problem and Analysis of Causes

Most of the previous efforts were focused on reducing the boarding patient number and length of stay in the ED. Despite the availability of good data in that regard, efforts failed to improve this problem. Obviously, it is a hospital-wide problem that needs each department's contribution which was not the case for different reasons.

Our ED quality committee came to the conclusion that we should take care of our home, not to wait for others to do so. Efforts were started to change the department culture to be the "change that starts from within".

Emergency patients' flow was displayed on flowcharts and areas of possible improvement were identified. This preparatory phase involved all the frontline workers in the department, i.e., physicians, in-training residents, nurses and administrative staff.

Intervention

Since no extra physical space was granted to the department, all the changes were in the processes and the functions of the different areas of the department. Five changes have been implemented. The results of our interventions were attributed to all of them but more analysis of each change would be needed to show the effect of each one. The changes made are:

NO TRIAGE	PHYSICIAN AT TRIAGE	VERTICAL vs HORIZONTAL PATIENTS	RAPID ASSESSMENT ZONE (RAZ)	HOLDING AREA
▪ When appropriate i.e., if there is a ready assessment area ▪ If the patient is next to be seen, triage is not needed (redundant) ▪ Direct Bedding model	▪ As appropriate i.e., if there are no available assessment area ▪ Initiation of investigations ▪ Satisfying the patient natural need of "I want to see the doctor"	▪ If a patient comes walking, then he can sit ▪ IV treatment can be given while seated .	▪ A new functional area of the department ▪ Quick in/out assessment area ▪ No active treatment area	▪ Waiting for radiology or laboratory results ▪ It is not the main waiting area

Strategy for Change

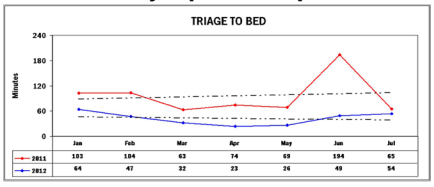
A collaborative team was formed. Staff education of the new interventions and patients' flow was done. Round table discussions, rehearsals, and trouble shooting took place to predict all the shortcomings. Patient education, although difficult, was an important part in our success.

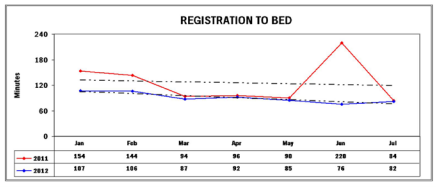
Measurement of Improvement

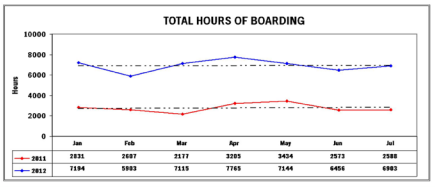
Using the electronic medical record, quality indicators that are needed to monitor the effect of these interventions were registered. Direct comparison between the years 2011 and 2012 was made.

Effects of Changes

Although average boarding time had become worse over 2012 by more than 200%, our ED overall performance had improved by 50%. We have not only improved our performance but also increased bed utilization.







Lesson Learned

Although it is easier said than done, applying the intervention one at a time would be more appropriate. This would allow all of those who are involved in the change to master it, then move to the next step. This would allow more precise data interpretation and measurement of the intervention validity.

Message for Others

In any process there are redundancies that should be identified and reduced. Emergency department directors should think of their patients' needs to satisfy them. Minor changes in processes may have significant impact.

Acknowledgement

Emergency Department staff (nurses, physicians, clerks) for their great contribution and effort in making this project a reality.
Emergency Quality Team for their hard work and passion for improvement.

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Saudi Medication Safety Center:

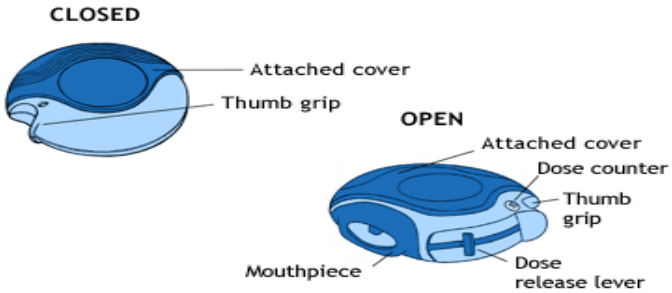
Proper Use of Dosage Forms / Devices (Part 2)

Dr. Gregory Poff, Chairman, Saudi Medication Safety Center, Ministry of National Guard-Health Affairs

This is a continuation from QPS Newsletter volume 5 / issue 4 / December 2013. As indicated in the fore mentioned article the purpose of the article is to provide information for proper use of specific dosage forms, which the healthcare provider can share with the patient / care giver to improve medication use outcomes.

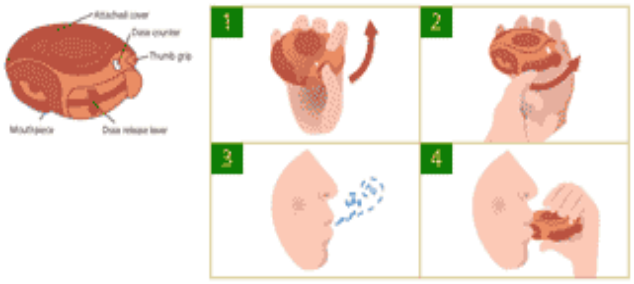
How to Use a DISKUS®

A DISKUS® is a dry-powder inhaler that holds 60 doses. It features a built-in counter, so that you always know how many doses you have left in it.



To use your DISKUS®:

1. Open your DISKUS®: Hold it in the palm of your hand, put the thumb of your other hand on the thumb grip and push the thumb grip until it "clicks" into place.
2. Slide the lever away from you as far as it will go to get your medication ready.
3. Breathe out away from the device.
4. Place the mouthpiece gently in your mouth and close your lips around it.
5. Breathe in deeply until you have taken a full breath.
6. Remove the DISKUS® from your mouth.
7. Hold your breath for about ten seconds, then breathe out.
8. Always check the number in the dose counter window to see how many doses are left.



If you drop your DISKUS® or breathe into it after its dose has been loaded, you may cause the dose to be lost. If either of these things happens, reload the device before using it.

How to use a Rotahaler®

1. Remove the Rotahaler® from its container.
2. Hold the Rotahaler® by the mouthpiece. Twist the barrel in either direction until it stops.
3. Take a Rotacap® from its container. Hold the Rotahaler® vertically and press the Rotacap® firmly, clear end first, into the raised square hole. Make sure that the top of the Rotacap® is level with the top of the hole. This will push the used Rotacap® shell, if one is there, into the Rotahaler®.
4. Hold the Rotahaler® level (horizontal) with the white dot upper-most. Twist the barrel until it stops. This separates the 2 halves of the Rotacap®. The Rotahaler® is now ready to use.
5. Breathe out slowly and fully, then immediately.

6. Raise the Rotahaler® to your mouth. Be sure to keep it level. Place the mouthpiece over your tongue and well into your mouth. Close your lips around the mouthpiece and tilt your head slightly backwards.
7. Breathe in through your mouth as deeply and fully as you can.
8. Hold your breath for about 10 seconds or as long as is comfortable and remove the Rotahaler® from your mouth. Hold your breath as long as you comfortably can before breathing out.
9. Pull the 2 halves of the Rotahaler® apart and discard the empty Rotacap® shells. There is no need to remove the shell that is still lodged in the square hole, except before cleaning.
10. Reassemble the Rotahaler®.
11. If your doctor has instructed you to use a second Rotacap®, repeat steps 2 to 10.
12. Rinse mouth with water.

How to look after the Rotahaler®

Always keep the Rotahaler® in its container to keep it clean.

At least every 2 weeks, wash the 2 halves of your Rotahaler® in warm water, making sure beforehand that the empty Rotacap® shell is removed from the raised square hole. Dry the Rotahaler® completely before putting it back together.

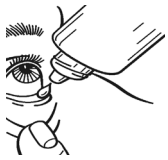
Get a replacement Rotahaler® after you have used it for 6 months. Make a note of the date on which you got your current Rotahaler® so that you will know when to replace it.

Do not swallow the Rotacaps®.

Only insert Rotacaps® into the Rotahaler® immediately before using.

Administration Guidelines for Eye Drops

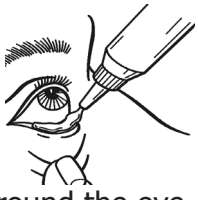
1. If you have difficulty telling whether or not eye drops touch the eye surface, refrigerate the solution before instilling it. Do not refrigerate suspensions.
2. Wash hands thoroughly. Wash areas of the face around the eyes. Contact lenses should be removed unless the product is designed specifically for use with contact lenses.
3. Tilt your head back.
4. Gently grasp lower outer eyelid below lashes, and pull eyelid away from eye to create a pouch.
5. Place dropper over eye by looking directly at it as shown in the drawing.
6. Just before applying a single drop, look up.
7. As soon as the drop is applied, release the eyelid slowly. Close eyes gently for 3 minutes by placing your head down as though looking at the floor (using gravity to pull the drop onto the cornea). Minimize blinking or squeezing the eyelid.
8. Use a finger to put gentle pressure over the opening of the tear duct.
9. Blot excessive solution from around the eye.



10. If multiple drop therapy is indicated, wait at least 5 minutes before instilling the next drop. This pause helps ensure that the first drop is not flushed away by the second, or that the second drop is not diluted by the first.
11. If using a suspension, place that drop in last.
12. If both drop and ointment therapy are indicated, instill the drops at least 10 minutes before the ointment so the ointment does not become a barrier to the drops' penetrating the tear film or cornea.

Administration Guidelines for Eye Ointments

1. Wash hands thoroughly. Wash areas of the face around the eyes.
2. If both drop and ointment therapy are indicated, instill the drops at least 10 minutes before the ointment so that the ointment does not become a barrier to the drops' penetrating the tear film or cornea.
3. Tilt your head back.
4. Gently grasp lower outer eyelid below lashes, and pull eyelid away from eye as shown in the drawing.
5. Place ointment tube over eye by looking directly at it.
6. With a sweeping motion, place ¼ to 1/2 inches (0.6 to 1.3 centimeters) of ointment inside the lower eyelid by gently squeezing the tube, but avoid touching the tube tip to any tissue surface.



7. Release the eyelid slowly.
8. Close eyes gently for 1 to 2 minutes.
9. Blot excessive ointment from around the eye.
10. Vision may be temporarily blurred. Avoid activities requiring good visual ability until vision clears.

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The CHAMP-Path Project Western Region NGHA Jeddah

Dr. Khaja Mujtaba Quadri، Chairman, Medicine Department, KAMC-J

The Department of Medicine WR, NGHA along with the departments of Pharmaceutical Care, Nursing, Quality Management, Health Education, Nutrition, Social Services, CIMS Riyadh, medical experts from across subspecialties and KAIMRC have collaborated since December 2010 in a project that has subsequently been recognized as Collaborative Healthcare Professionals Approach to the Monitoring of Patient-centered outcomes through Clinical Pathways (CHAMP-Path).

The project began with a need to address the patient flow challenges in the Medicine department. Another objective was to attempt to study and implement the organizational leadership vision of achieving "timely, patient-centered care" as espoused by the CEO.

The 2009 and 2010 statistics from Medical Records and Health Informatics, suggested that sixteen diagnoses constituted the most frequent sources of Medicine admissions. These in addition to their frequency, were error-prone and high risk or high cost as a result of prolonged length of stay (LOS) .

Although a few clinical pathways would have sufficed for Joint Commission accreditation, the collaborating professionals chose to develop (over a nine month period encompassing more than 60 meetings) integrated clinical pathways encompassing stroke, meningitis, seizures, pneumonia, asthma, venous thromboembolism, acute coronary syndrome, heart failure, uncontrolled hypertension, acute kidney injury, chronic kidney disease, Diabetic ketoacidosis, hyperosmolar non ketotic state, Gastrointestinal bleeding and hepatic encephalopathy. These were evidence-based and in congruence with regional infrastructure and services available. A particular feature was computerized pathways with preset orders and CPOE in a time-table format with inclusion/ exclusion criteria, targeted outcomes and expected lengths of stay. The pathways were laboriously developed and formatted into pathway templates, with the CIMS team.

Since there is conflicting evidence in terms of clinical pathways being successful across most of these common diagnoses or non-existent evidence, it offered a great opportunity to write up a research proposal for grant approval by KAIMRC.

Thus a proposal for pragmatic randomized controlled trials comparing pathway care versus usual care was submitted, refined and gratefully approved by KAIMRC. The CHAMP-Path trials were thus born and are registered on clinicaltrials.gov; number, NCT01561885 and underway since March 2012.

The logistics limited the trials to five principle diagnoses with a sample size of 504. To date 178 patients have been recruited across the diagnoses of heart failure, community acquired pneumonia, asthma, venous thromboembolism and acute kidney injury.

The primary endpoint is a decrease in LOS of two days and secondary objectives are 30-day rehospitalization rates, determinants of LOS and patient-centeredness as assessed through validated CHAMP-Path survey.

Several mini–projects have subsequently given birth within the gamut of the master proposal as approved. Four papers were presented in 2012 at the third KAIMRC forum and four are being submitted in 2013.

It is anticipated that each of these five trials (being done on the Clinical teaching units 1 and 2 of the Department of Medicine) will provide robust evidence of whether pathways actually work in a real-life setting to pragmatic trials are primary measures of clinical effectiveness.

All pathways have been available for piloting from the past two years in the QuadraMed® system and our experience is likely to promote further widespread use of clinical pathways not only institutionally, but also worldwide.

This is your Newsletter and we value your comments. Please recommend Quality Improvement Projects in your area. We strongly encourage you to share patient safety information.
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