

Characteristics of Patients with Severe Hypoglycemia among Patients with Diabetes Using Insulin in Commercially insured, Medicare, and Medicaid Populations

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Presentation
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Background

- Severe Hypoglycemia (SH) is an important complication among patients with diabetes using insulin requiring assistance from other persons.¹
- Risk for SH increases with longer duration of Type 1 diabetes and increasing duration of insulin therapy in Type 2 diabetes.²
- Emergency medical services (EMS), emergency department (ED) visits, and hospitalization, may be required to resolve some SH events. It is estimated that the median cost across all payers (Commercial, Medicare & Medicaid) associated with EMS treatment alone was \$140, and \$1,281.6 if ED is required additionally. The cost could be up to \$11,037.5 when hospitalization is required in addition to EMS and ED.³
- Understanding characteristics of patients who experience SH may help clinicians and policy makers develop, and tailor prevention strategies and emergency preparedness planning, to be implemented in the areas of need.

Objective

This study aimed to describe profiles of patients with SH based on different characteristics (e.g., diabetes type, and insulin use)

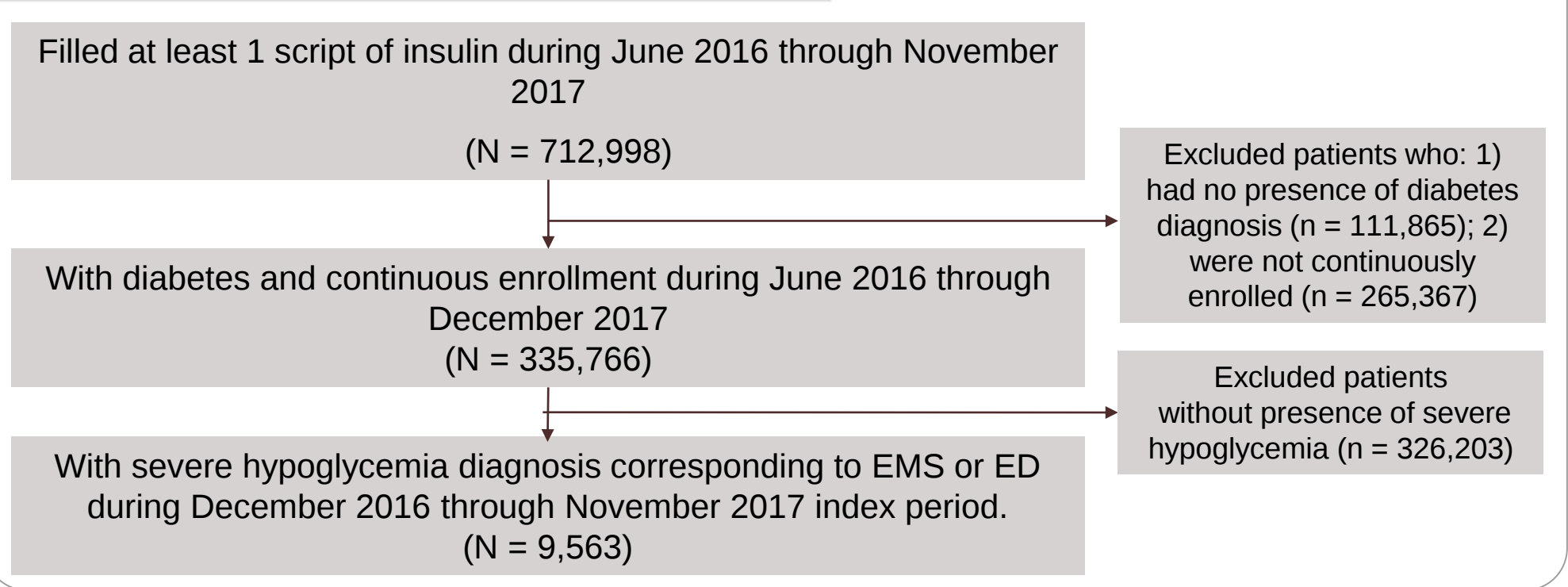
Methods

Study design: This retrospective study utilized IBM MarketScan Research Database to observe patients experiencing SH between December 2016 and November 2017.

Sample selection: A total of 335,766 patients met these following inclusion criteria: presence of diabetes and insulin claims, and continuous enrollment in health plans. Patients with at least one SH (N = 9,563) were identified using ICD-9-CM/ICD-10-CM codes who were initially treated by emergency medical services or emergency department (Figure 1).

Analysis: Patient characteristics, including age, insurance type, diabetes type, and insulin use, were examined.

Figure 1. Cohort Flowchart diagram



Results

Patient Characteristics

During the one-year observation period, 9,563 (2.8%) patients with SH were identified with a mean age of 54 years. Of those, 37.7% were Type 1 diabetes (T1DM) and 62.3% were Type 2 diabetes (T2DM).

Table 1. Characteristics of Patients with Severe Hypoglycemia	
	Cohort (N=9,563)
Age, years, mean (SD)	54 (19.9)
Gender	
Male, n(%)	4,527 (47.3)
Female, n(%)	5,036 (52.7)
Health Plan	
Commercial, n(%)	3,392 (35.5)
Medicare, n(%)	2,442 (25.5)
Medicaid, n(%)	3,729 (39.0)
Diabetes Type	
T1DM, n(%)	3,602 (37.7)
T2DM, n(%)	5,961 (62.3)
Insulin Type	
Basal Only, n(%)	1,529 (16.0)
Basal/Bolus, n(%)	7,571 (79.2)
Premixed Only, n(%)	463 (4.8)

Table 2. Number and Proportion of Patients with SH across 30 Patterns of Characteristic Combination				
Healthcare Payer Type	Diabetes Type	Age Group	Insulin Type	Cohort (N=9,563) n (%)
Commercial	T1DM	Adult (>=18yrs)	Basal Only	46 (0.5)
			Basal/Bolus	1488 (15.6)
			Premixed Only	17 (0.2)
		Pediatric (<18yrs)	Basal Only	3 (0.0)
			Basal/Bolus	178 (1.9)
			Premixed Only	0 (0.0)
	T2DM	Adult (>=18yrs)	Basal Only	427 (4.5)
			Basal/Bolus	1135 (11.9)
			Premixed Only	98 (1.0)
		Pediatric (<18yrs)	Basal Only	0 (0.0)
			Basal/Bolus	0 (0.0)
			Premixed Only	0 (0.0)
Medicare	T1DM	Adult (>=18yrs)	Basal Only	21 (0.2)
			Basal/Bolus	270 (2.8)
			Premixed Only	15 (0.2)
	T2DM	Adult (>=18yrs)	Basal Only	606 (6.3)
			Basal/Bolus	1337 (14.0)
			Premixed Only	193 (2.0)
Medicaid	T1DM	Adult (>=18yrs)	Basal Only	28 (0.3)
			Basal/Bolus	1078 (11.3)
			Premixed Only	16 (0.2)
		Pediatric (<18yrs)	Basal Only	0 (0.0)
			Basal/Bolus	441 (4.6)
			Premixed Only	1 (0.0)
	T2DM	Adult (>=18yrs)	Basal Only	397 (4.2)
			Basal/Bolus	1638 (17.1)
			Premixed Only	123 (1.3)
		Pediatric (<18yrs)	Basal Only	1 (0.0)
			Basal/Bolus	6 (0.1)
			Premixed Only	0 (0.0)

Figure 2. Characteristic combination groups that accounted for the largest number of Patients with SH

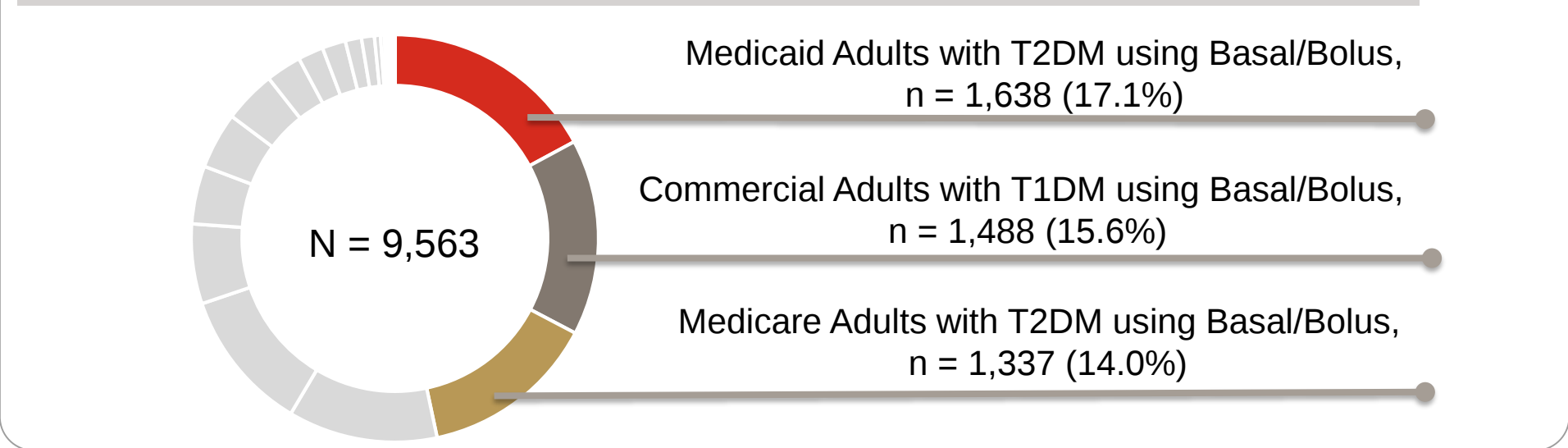


Figure 3. Characteristic combination groups that accounted for the largest number of Patients with SH by Diabetes Type

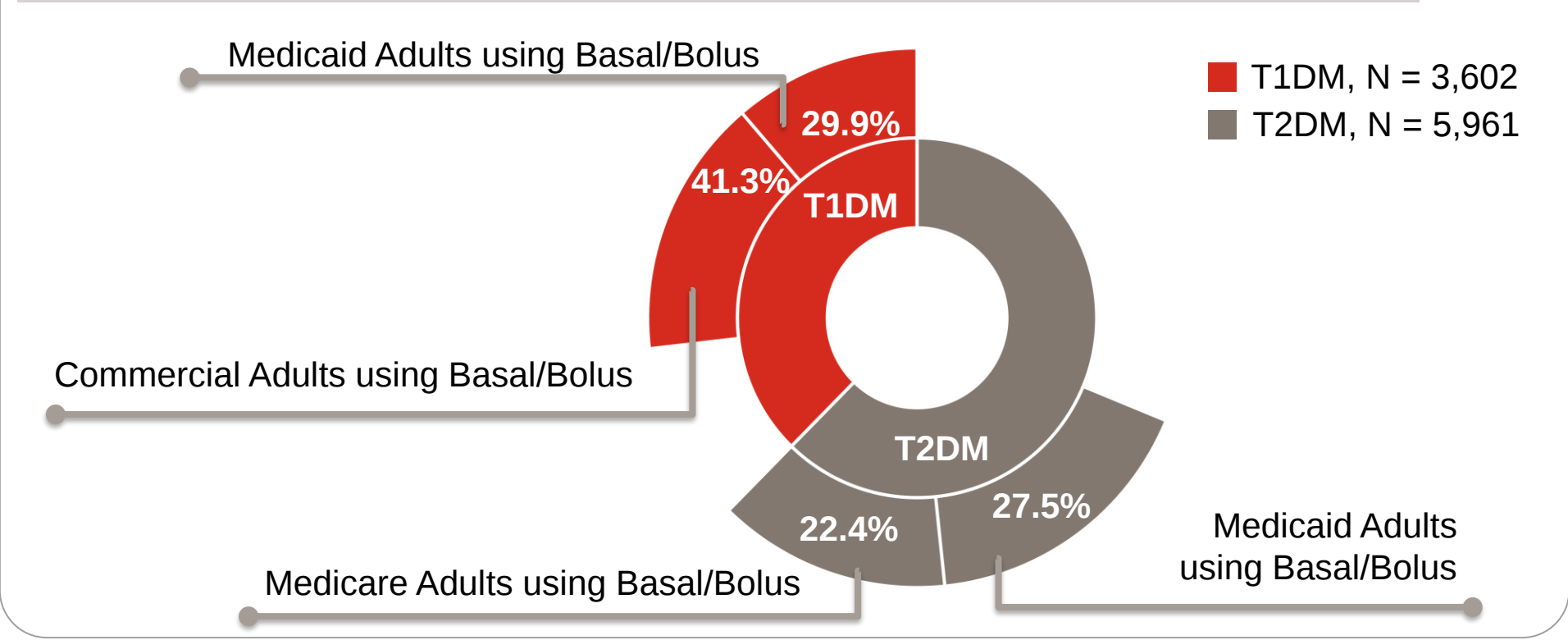
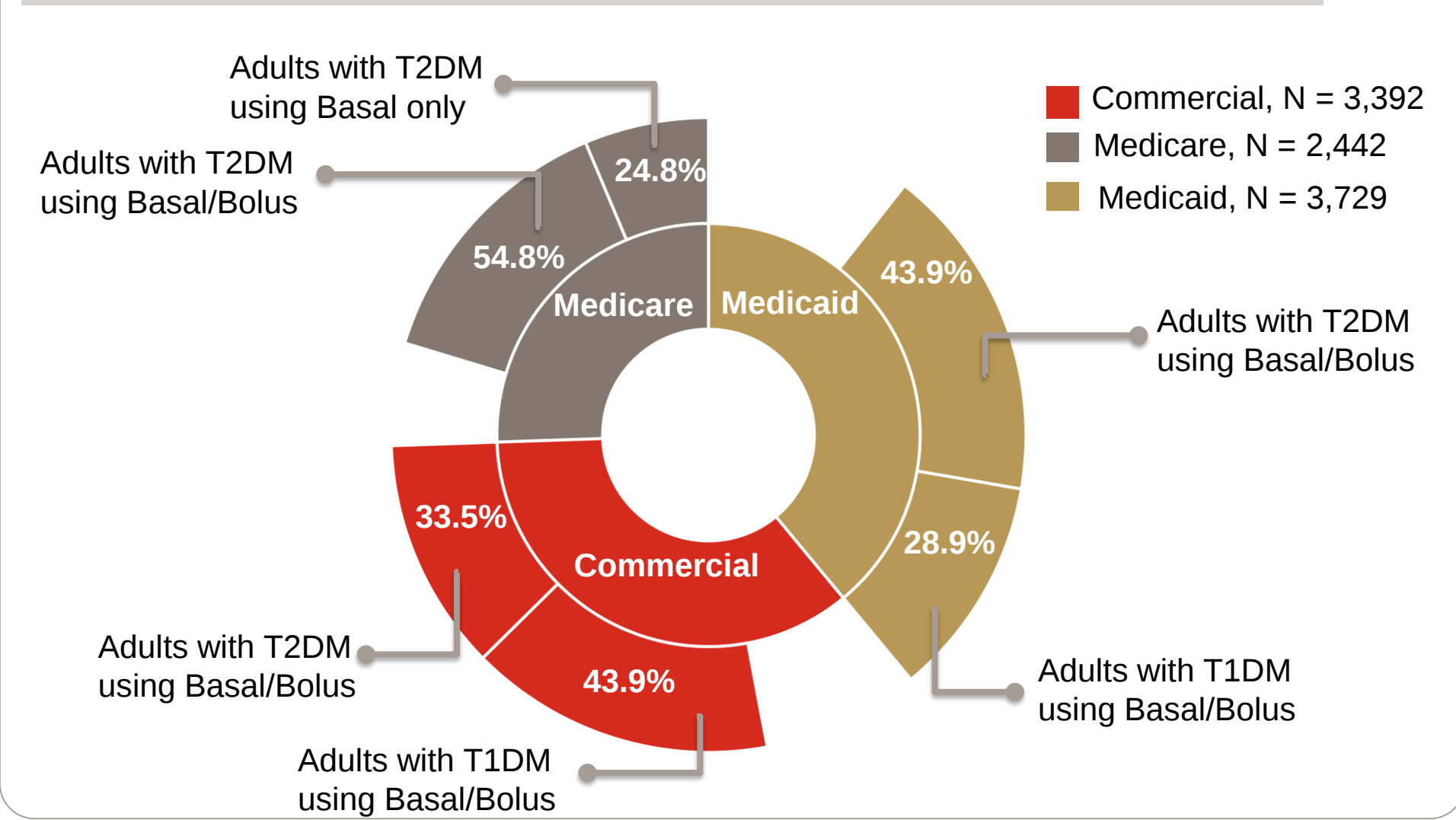


Figure 4. Characteristic combination groups that accounted for the largest number of Patients with SH by Healthcare Payer



Discussion and Limitation

- Using basal and bolus insulin was a common characteristic found across groups accounting for the large proportion regardless of healthcare payer type. In addition, people with T2DM taking basal insulin only is sizable portion of Medicare population that may require attention on preventive SH strategies and emergency preparedness plans.
- One of the study limitations is associated with using claims data where some SH events may not be coded for reimbursement. Number of SH patients could be underestimated.

Conclusions

This study reveals some patient profile patterns that may benefit from targeted interventions to prevent SH and get patients with diabetes prepared and protected. A majority of those experiencing SH in this database were people with T2DM; they may represent an underrecognized group in need of intervention. Continued research is warranted concerning the financial burden of SH and impact of interventions on different patient profile groups.

Disclosures: All authors are employees of Eli Lilly and Company.

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