

Review Article

# Beginnings of bariatric and metabolic surgery in Spain

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## Overview

Bariatric Surgery (BS) from the Greek *bari* = weight and *iatrein* = cure) treats obesity and began in Spain in 1973. Its greatest development occurs after the founding of SECO (Spanish Society of Obesity Surgery) in 1997. The purpose of this work is to reflect the changes that have occurred in these 22 years.

Obesity is a multifactorial epidemic ailment of environmental origin, affecting subjects from all countries, and whose origins are not in the stomach or intestine. It represents a unique case of surgery to operate healthy organs, which are not the cause of the disease and do not improve after the operation.

Henryson [1] initiated Obesity Surgery (OS) in 1952. Kremen & Linner [2] and Varco & Buchwald in Minneapolis, MN teams began the malabsorptive intestinal diversion (ID) in 1954. Payne [3] and Scott [4] developed these ID techniques in the 1960s leaving only 14-4 inches (35-10 cm) as an absorptive zone and those were abandoned in the 1970s because of their serious metabolic (malnutrition) and hepatic (liver failure) complications.

Buchwald [5] initiated the ID of the last third of the intestine for hypercholesterinemia (POSCH) and showed its protective role at 25 years in the development of atherosclerosis. Now it has also been abandoned, not because of lack of effectiveness, but because of the development of nystatin in the medical control of cholesterol. Dr. Henry Buchwald remains active 67 years later, and in 2012 Barcelona was appointed as Honorary Member of the Spanish Society of Obesity Surgery (SECO) and he will participate in Madrid-IFSO 2019. Baltasar [6] published in 1991 the only three ID in Spain for hypercholesterinemia.

## First spanish experience

Prof. Sebastián García Díaz of Seville carried out the 1<sup>st</sup> Scott-type Jejunum-ileal diversion (JID) in the Virgen Macarena Hospital on 11.19.1973. He began bariatric surgery in Spain with 12 cases [7-10] and then published 20 more, the 1<sup>st</sup>

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Submitted: 06 December 2019

Approved: 26 December 2019

Published: 27 December 2019

How to cite this article: Baltasar A. Beginnings of bariatric and metabolic surgery in Spain. Arch Surg Clin Res. 2019; 3: 082-090.

DOI: dx.doi.org/10.29328/journal.ascr.1001042

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Keywords: Morbid obesity; Bariatric surgery; SECO

Abbreviations: VBG: Vertical Banded Gastroplasty; GB: Gastric Banding; RY-GBP: Roux-en-Y Gastric Bypass; OAGB: One Anastomosis GBP / mini GBP; BPD: Bilio-Pancreatic Diversion; ID: Intestinal Diversion; DS: Duodenal Switch; SADI: Single Anastomosis Duodenal-Ileostomy; SFG: Sleeve-Forming Gastrectomy; ABS: Adolescent Bariatric Surgery; REV: Revision/Conversion of Prior Surgery; WL: Weight Loss; MO: Morbid Obesity; %EWL: % Excess Weight Loss; %ExBMIL: %Expected BMI Loss; L: Laparoscopic



work in English by a Spanish author [7] in the World Journal of Surgery in 1981. For this 2<sup>nd</sup> work he received the award by the Seville Hospital of the Five Sores in 1979 (Figure 1). His work went unnoticed for 40 years until we rescued them in 2013 [11].

There are two Spanish JID done by Drs. Sánchez/Masdevall in Barcelona Bellvitge Hospital on March 1976 and another by Dr. Martínez, Zaragoza Clinic Hospital on July 12, 1978.

Buchwald [12] describe (Figure 2) the tree of the development of this surgery in the 1970s with a big malabsorptive and restrictive operation. The evolution of malabsorptive surgery is on the left, and restrictive surgery and gastric bypass (GBP) were reported.

In 1964 Mason [13] initiates the GBP. It was a total change in strategy. Capella [14], ÁlvarezCordero [15] (both

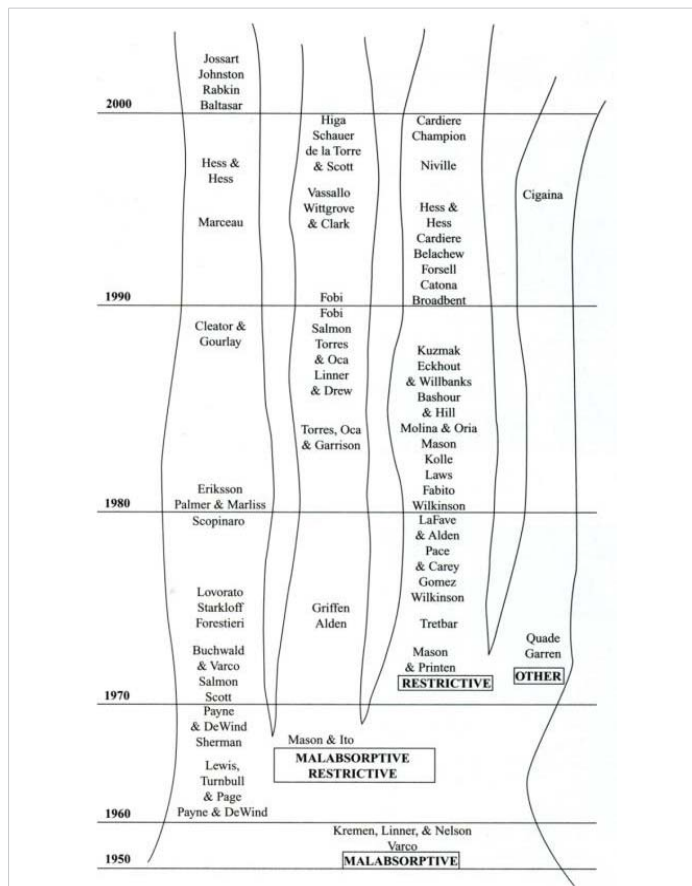


Figure 1: Bariatric techniques.



Figure 2: H. Buchwald, R. Mason, S. Garcia, N. Scopinaro.

first SECO Honorary Members) and Fobi [16] made very important contributions to this technique and many other authors in the 1970s.

Baltasar [17] performed in June 17, 1977 the first Mason-type GBP in Spain. Vara [18], De la Cruz [19] and Sitges [20] wrote in Spain about ID in hypercholesterinemia and GBP in obesity.

Scopinaro [21], a tireless researcher and clinician, initiated experimental and clinical gastrectomy with biliopancreatic diversion (BPD) in 1976 [22,23]. He is the leader and “father of European bariatric surgery” and participated in multiple congresses and publications. His combined mixed a technique of gastrectomy plus BPD as the most effective for treating obesity [24]. He is an Honorary Member of SECO and the only foreign Outstanding Achievement Award winner (OAAW) of the American Association of Metabolic and Bariatric Surgery (ASMBS).

DBP became a very popular and was a commonly used technique in Spain. Larrad and Sánchez [25-28] published extensively on a modification of their own and other authors used this technique in Zaragoza [29-32], Santander [33,34] and Barcelona.

Mason [35] “father of BS” published in 1982, 18 patients on vertical banded gastroplasty (VBG) and it was the 1<sup>st</sup> great revolution by making OS “easy and affordable”.

In 1984, Baltasar [36] broadcasts in RTVE the 1<sup>st</sup> Spanish documentary in MO entitled “JJ Soriano more moral than the Alcoy man” with IMC-52 and that blocked the telephone lines of the hospital. Laporte [37] published the 1<sup>st</sup> Spanish VBG experience in 9 cases.

Reopening of the vertical staple-line was a serious disadvantage of the VBG because it cancels out the restrictive effect of the operation. Baltasar [38] in 1989 described the separation with staples between gastric tube and major curvature and did not have a single recanalization in 100 cases. McLean [39] used the same technique three years later. Alcoy’s Andreo [40] describes the typical radiological “peanut deformity” of the VBG.

Many Spanish surgeons performed VBG [41-43]. Baltasar [44] published his first 100 cases in 1990 with excellent results, but 5 years later he reviewed the same patients and describes it as a “frustrated hope” [45,46]. And two years later this technique was abandoned.

Belachew [47,48] in Belgium initiated on 1/09/1993 laparoscopy the 2<sup>nd</sup> revolution in bariatrics with the 1<sup>st</sup> laparoscopic adjustable gastric band (LAGB) operation.

Favretti [49] performed on Sept 27.1995 the 1<sup>st</sup> LAGB operation in Spain at Madrid “La Paz” Hospital (Figure 3) assisted by Masdevall/baltasar Carbajo [50] in 1986 made the 1<sup>st</sup> 12 BGL in Spain and Alastrué [51] compares VBG with BGLA. Thousands of BGLA were done all over the world and then it was abandoned. Laparoscopy changed the way of doing surgery not only in BS but also in all general surgery. Advances in bariatric laparoscopy, being repetitive operations and performed on healthy organs were the greatest advance in XX century surgery.

In the 90’s the 1<sup>st</sup> national bariatric societies were created, starting with the American Society of Bariatric Surgery (ASBS) by Edward Mason on June 3,1983 in Iowa City, IO [52], the town he worked all his life. Deitel created Obesity Surgery, as the 1<sup>st</sup> journal of obesity in 1990 [52].



Figure 3: F. Favretti, 1<sup>st</sup> Spanish LGB. “La Paz” Madrid. 1995.

In 1995 the International Federation of Surgery for Obesity (IFSO) is founded and standards [53] devised for reporting results.

The Spanish Society of Obesity Surgery (SECO) was founded at Residencia Pérez Mateos, San Juan, Alicante by 26 surgeons on December 12.1976 (Figure 5).

**SECO founding members**

December 12.1976 (Figure 6)

SECO joined IFSO in 1998 and AB became IFSO-2002 president. He organizes and preside IFSO-Salamanca-2003. Dr. Antonio Torres, 2<sup>nd</sup> Spanish president of IFSO organizes IFSO-2019 Madrid, the world’s largest bariatric meeting. Spain will be the 2<sup>nd</sup> country that organizes this congress twice.

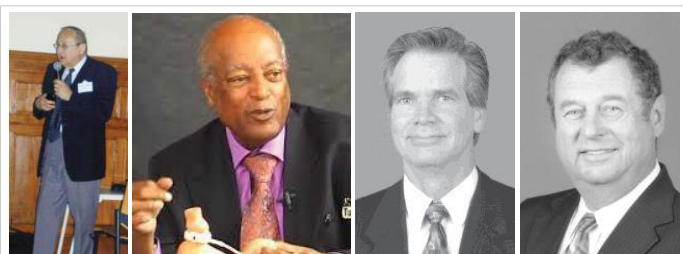


Figure 4: M. Deitel, M. Belachew, A. Wittgrove, W. Clark.



Figure 5: SECO-1976 SECO-2015 Baltasar-2011-AMSBS-OAAW.

- San Juan. Alicante, España
1. Aniceto Baltasar Alcoy
  2. Juan Pujol Barcelona
  3. Miguel A. Carbajo Valladolid
  4. Santiago Tamames Madrid
  5. Carlos Escalante Santander
  6. Horacio Urquijo Madrid
  7. Cándido Martínez Vitoria
  8. Francisco Arlandis Alcoy
  9. Rafael Bou Alcoy
  10. Miguel A Calvo Bilbao
  11. Antonio Alastrué Badalona
  12. Eugenio Urquijo Madrid
  13. Carlos Cerquella Madrid
  14. Felipe de la Cruz Madrid
  15. Mario García Madrid
  16. Luis García Vallejo Santiago
  17. Federico Leruite Granada
  18. Juan Machuca La Coruña
  19. José M<sup>o</sup> Recio Barcelona
  20. Carlos Masdevall Barcelona
  21. Salvador Serrano Burgos
  22. Tomeu Feliú Gerona
  23. Antonio Soro Mallorca
  24. Antonio Martín Madrid
  25. Mariano Martínez Zaragoza

Figure 6: SECO Founding members.

Wittgrove and Clark in October 27, 2003 [55-57] made the most significant step in performing the 1<sup>st</sup> laparoscopic gastric bypass (LGBP) in San Diego. This is the 3<sup>rd</sup> revolution of the BS. AB was the 1<sup>st</sup> visitor in September 2007 in San Diego, and to our proposal Wittgrove [58] dropped the huge circular #33 port and use the circular stapler without trocar, a very important step in those early times.

We performed the 1<sup>st</sup> LGBP in Spain on 1.14.1997 [59] and presented it [60] at Bruges IFSO-1998 the 1<sup>st</sup> European to report it on video. Serra [61] published in 1999 the 1<sup>st</sup> world hernia after LGBP. Higa [62] made fortunately the 1<sup>st</sup> LGBPs with manual sutures.

Baltasar [63] published the 1<sup>st</sup> book in Spanish in OS in 2000. Martínez [64] from Vitoria published a bilingual BS book (Spanish and Basque) on 2001. De la Cruz [65] published in 2006 the 1<sup>st</sup> book on LGBP in Spain and carried out the 1<sup>st</sup> surgical session in León. García-Caballero published an English book on diabetes surgery (Figure 7).

In 1988, Hess [66] and Marceau [67] initiated the duodenal switch (DS), a Sleeve-forming Vertical Gastrectomy (SFVG) plus BPD and Baltasar [68] started it on 3.17.1994.

Ren/Gagner [69] performed the 1<sup>st</sup> world LDS in October 1999 and Baltasar on 5.10.2000 [70] the 1<sup>st</sup> LDS in Europe. (Figure 8). This difficult and controversial technique by the Switchers surgeons, is rarely used today, in less than 1%.

1. Dec 1997 Aniceto Baltasar Torrejón
2. May 2001 Cándido Martínez Blázquez
3. Oct 2004 José C. Fernández-Escalante
4. April 2007 Antonio José Torres García
5. April 2011 Carles Masdevall Noguera
6. April 2013 Felipe de la Cruz Vigo
7. May 2015 Juan C. Ruiz Adana Belbel
8. March 2017 José A. Ramírez Felipe
9. Sept 2019 Raquel Sánchez-Santos

Figure 7: SECO Presidents.



Figure 8: Baltasar-2000, C. Martínez, De la Cruz, Diabetes de Caballero. Books published by SECO members.

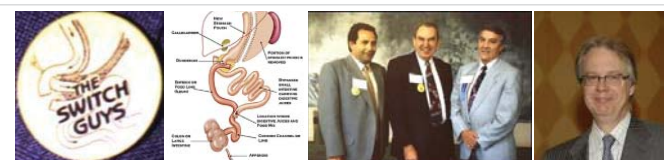


Figure 9: Switchers logo DS, AB/Hess/Marceau, M. Gagner.

Baltasar [71] on 950 patients had a low mortality of 0.4% with LDS and is the most effective technique to lose weight. There have been many technical variations in laparoscopy. In general, all viscera division is done with auto sutures. The anastomosis is done either with auto sutures or manual ones. We advocate the manual suture starting always with the sliding, self-locking sliding knot of Serra - Baltasar [72,73].

SECO members reported BS surgeries in the early years of OS and SOARD. Spain was the 2<sup>nd</sup> country with the highest number of publications after the USA in 2005 and 2006 and in 2013 was the 5<sup>th</sup> country with the highest number of publications in SOARD (Figure 10).

SECO members have been very active publishing in OS and SOARD (Figures 8,9). Among the SECO founding members there has been a high bibliographic volume (Alcoy-124, Carbajo-76, Belvitge-38, Alastrué-30, Martín-Duce-27, Martínez C.-22, Ballesta-9, Zaragoza-5). In 2003 SECO made the Salamanca Declaration on BS [74].

Laparoscopic Sleeve-forming gastrectomy (LSFG), the restriction part of DS, was so described by several authors in

2005. Baltasar LSFG [75], according to Ahmad [76] is the 61<sup>st</sup> most cited article in all the bariatric literature. Angrisani [77] claims that the LSFG is today the most commonly performed operation in the world.

We start the gastrectomy at the pylorus and suture the gastric anterior and posterior serosa, covering the staples, to prevent rotation of the sleeve and avoid leaks.

Rutledge described 1,274 cases of mini-gastric bypass in 2001 [78] and Spanish authors have developed two popular techniques. Carbajo [79] performs since 2004 the lesser curvature reservoir without gastric resection, the one anastomosis OAGB, a GBP with latero-lateral diversion to an intestinal loop. He presented more than 3,500 cases at the 1919s World Congress in Valladolid and is today the fastest growing technique in the world (Figure 11).

Sánchez and Torres [80] at Madrid Clinic Hospital, describe in 2005 the one anastomosis DS or SADI in English. There is gastric resection in the form of SFG and the BPD is done end-to-side at the duodenum (D1). The operation is becoming very popular all over the world. Currently they have more than 350 cases (Figure 12).

BS at Barcelona Bellvitge hospital has organized 16 consecutive bariatric courses and Torres/Sánchez another 16 annual courses at Madrid Clinic Hospital.

We founded BMI-Latina Journal (Iberoamerican Bariatric and Metabolic) [www.bmilatina.com](http://www.bmilatina.com) in 2011 as an online magazine published in Spanish, English and Portuguese. Adopted by SECO in 2015, it should play a valuable role in Spanish and Portuguese speaking BS societies but since 2015 only the abstract is published in English, and that may restrict its dissemination.

In 2009, Scopinaro, Melissas, Fried and AB create the

Paters in Obesity Surgery.			
Argentina	1	Korea	1
Australia	7	Mexico	1
Austria	5	New Zealand	2
Belgium	6	Netherlands	3
Brazil	20	Poland	4
Canada	6	Saudi Arabia	3
Chile	4	Spain	31
France	20	Sweden	1
Germany	3	Switzerland	5
Greece	8	Taiwan	1
Iceland	1	Turkey	2
Israel	6	United Kingdom	4
Italy	20	USA	84
<b>Total</b>			<b>250</b>

Table 1. Papers in OBESITY SURGERY by Country, January – December 2006					
Argentina	3	Germany	10	Russia	1
Australia	11	Greece	12	Saudi Arabia	2
Austria	13	Israel	10	Singapore	2
Belgium	12	Italy	25	Spain	33
Brazil	27	Korea	3	Sweden	5
Canada	8	Kuwait	1	Switzerland	12
Chile	5	Lebanon	2	Taiwan	7
China	3	Mexico	2	Turkey	3
Cyprus	1	New Zealand	4	United Kingdom	7
Czech Republic	2	Netherlands	9	USA	106
Finland	1	Poland	5		
France	24	Portugal	3	Total	374

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Obesity Surgery, 16, 2006 1553

Publicaciones españolas de SECO en Obes. Surg. 2005-6.

SURGERY FOR OBESITY AND RELATED DISEASES	
United States	590
United Kingdom	23
Canada	23
Italy	19
Spain	13

Figure 10: Spanish publications in SOARD 2014.

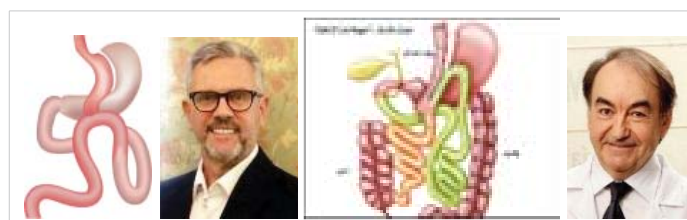


Figure 11: OAGP R. Rutledge; OAGBP MA. Carbajo.

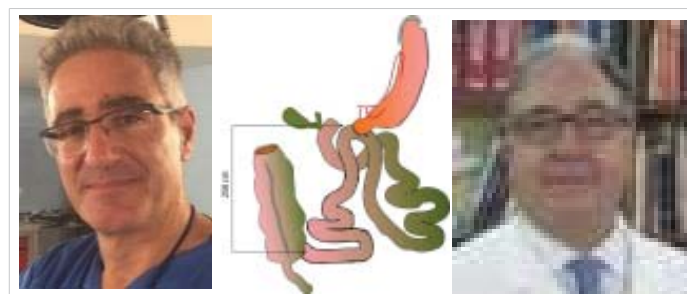


Figure 12: A. Sánchez; SADI; A. Torres.

IFSO European Chapter of the Centers of Excellence Program (ECEP). Currently, several Spanish centers and surgeons use this prestigious quality control program.

SECO members have participated in numerous local, regional, national, and international meetings and congresses, especially in Latin American societies where SECO has always been very kindly well received. In May 1998 we organized a table at the meeting of the prestigious course of Prof. Moreno González, with Drs. Cowan, Fobi, Scopinaro, Clark & F.de la Cruz.

In 2003, AB inaugurated the Spring (NYC) and Fall (Chicago) two keynote lectures at the American Congress of Surgery with on DS.

AB received the IFSO-Lifetime Membership Award in June 2011 and was a finalist for the prestigious ASMBS-Outstanding Achievement Award at the ASMBS meeting in Orlando, Florida (Figure 4).

### Diabetes surgery

Part of the BS is dedicated to diabetes as metabolic surgery. Baltasar [80] publishes a successful 1<sup>st</sup> intervention in 2004 BPD-without-SFG.

Resa and Solano [82] describe 65 cases of gastroileal bypass as the simplest, quickest and safest technique we know for treating obesity. And then Resa [83] again publishes 1512 more cases. Alhambra [84], Vidal [85], Vilarrasa [86], García [87], Cruz [88] and Torres [89] have published on the same subject.

### Laparoscopic OS in Children and Adolescents (ABS)

OS is increasingly used in children. Baltasar [90,91] published the 1<sup>st</sup> national SFG in 2004 on a 10-year-old boy with excellent results 10 years later.

Carbajo [92] has a case with 5 years follow-up and then in 2019 again [93] reports the more extensive experience in CLONA with 39 patients treated with OAGBP with excellent results.

Vilallonga [94] reports that the overweight rate in 4–24 years-old children has increased by approximately 10% in the last 20 years. It is estimated that today, 20% of boys and teenagers and 15% of girls are overweight.

### Robotics bariatric surgery

Cadiere and Favretti performed the world's 1<sup>st</sup> robotic



Figure 13: Da Vinci R. Vilallonga; S. Morales; A. Lacy.

bariatric operation at a distance in 1998. Diez and Blázquez perform the first 12 robotic Spanish bariatric surgeries in Vitoria-2013. Vilallonga (1<sup>st</sup> accredited robotics surgeon in Spain) and Fort from 2010 in the Hospital Vall d'Hebron in Barcelona develop robotic surgery [94] and performed more than 540 cases with the da Vinci (Figure 13). Surgical System® (Intuitive Surgical, Sunnyvale, CA) at the beginning with GV and then DG robotics [95].

Morales [96] performs in Seville the complex single port surgery of since 2012 and today leads the European surgery [97].

A. Lacy initiated AIS-Channel as a pioneering worldwide on-line TV transmission and made the 1<sup>st</sup> BS remote operation by cellphone G5 from Barcelona Clinic Hospital on 4.14.2019 at the WORLD-VIDEO Forum Barcelona-2019.

The biography of members of the Spanish society [98-101] has been published in the *Obes. Surg.*

### Surgeries performed in Spain 2018

1<sup>st</sup> Surgeries: 5.952; 2<sup>nd</sup> Revision: 343:

Total Complications: LGBP-3.7% and LSFG-3.6%; LGBP-Leaks-1.2%, Bleeding-2.3%, PET-0.1% Re-op-2.3% Exitus-0.1% and in SFG-Leaks-1.5%, Bleeding-1.9% PET-0.1% 2.1% Deaths-0.1%. Extraordinary good results!

Private centers report multiple operations over the years with different techniques: Valladolid-4.255, Teknon-3.000, De la Cruz-2.493, Zaragoza-2.649, Alcoy-1.729.

We should publish all serious complications such as malnutrition [105], leaks [106,107], total gastrectomy's [108], liver failure [109,110], stapling of the bougie [111], emergency tracheostomy [112] and mistakes as the Journal of negatives or non-positive results (JNNPR) [114], since it is more likely to learn from negative results than positive ones.

BS is performed in public centers in all regions of Spain with very low leakage and complication rates. But... it is not yet performed on an outpatient basis.

If OM is an epidemic pathology and if CB is the best solution, it should be accessible to more subjects. Duncan [109] performs ambulatory BS, and this will be the 4th great bariatric revolution. His A-team uses 2 operating rooms, 2 anesthesiologist nurses, 2 scrub nurses and an operating room technician as an assistant. Operative times of 22'. The surgeon passes to OR-2 with the patient already anesthetized. He changes gloves and do 5 patients in total in the morning. In the afternoon, surgeon-B operates while team-A have consultations. Total 10 patients per day. 50 cases per week, 2,200 cases per year. No overnight stay. All morning patients are discharged before 14 hours. There is no hospitalization.

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