

Toward a Standardized Definition of Distal (Ileal) Metabolic Bariatric Surgery: An International Modified Delphi Consensus

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Abstract

Background

Distal (ileal) metabolic bariatric surgeries (DMBS) have gained increasing adoption due to their enhanced metabolic effects. However, the absence of standardized definitions, classification, and clinical indications limits their consistent application. This consensus aimed to establish an international consensus on the definition, classification, indications, and postoperative management of DMBS.

Methods

A three-round modified Delphi study was conducted including international expert surgeons from 16 countries. A total of 98 statements were developed across three domains: procedural characteristics, patient selection, and postoperative follow-up. Consensus was defined as $\geq 75\%$ agreement. Statements not reaching consensus were revised and resubmitted.

Results

Consensus was achieved on 81 statements. DMBS were defined as procedures involving gastro-ileal or duodeno-ileal bypass, emphasizing ileal stimulation as a key metabolic mechanism. Procedures with a common channel ≤ 350 cm, including single-anastomosis duodenal-ileal with SG (SADI-S), single anastomosis sleeve-ileal transit bipartition (SASI), sleeve gastrectomy with Roux-en-Y transit bipartition (SG+TB), and biliopancreatic diversion with duodenal switch (BPD-DS), as well as one-anastomosis gastric bypass (OAGB) with biliopancreatic limb $> 50\%$ of total small bowel length were classified as DMBS. Routine measurement of total small bowel length was strongly recommended.

DMBS were considered appropriate as primary procedures in patients with BMI ≥ 40 kg/m² with comorbidities, a BMI ≥ 50 – 60 kg/m², irrespective of the presence of comorbidities, and as revisional options for suboptimal clinical response (SoCR), recurrent weight gain (RWG), or persistent metabolic disease. Comprehensive preoperative and multidisciplinary evaluation was deemed mandatory, and liver cirrhosis, heart failure, end-stage kidney disease, and inflammatory bowel disease were considered contraindications.

Postoperative care requires lifelong multidisciplinary follow-up, with increased attention to nutritional deficiencies and supplementation.

Conclusions

This consensus provides a standardized framework for DMBS, supporting harmonization of practice and improved patient safety.

Introduction

Although metabolic bariatric surgery (MBS) is highly effective, outcomes with commonly performed procedures such as sleeve gastrectomy (SG) and Roux-en-Y gastric bypass (RYGB) may be suboptimal in specific populations. In fact, more than 50% of patients with class IV obesity, defined as a body mass

index (BMI) > 50 kg/m², remain with a BMI > 35 kg/m² after these procedures or experience significant recurrent weight gain (RWG) (1–3). Related to the latter and given the chronic, progressive and recurrent nature of obesity and its associated diseases, revisional MBS procedures have increased significantly in recent years, now accounting for approximately 7% to 15% of all MBS procedures (4).

Meanwhile, procedures with enhanced ileal stimulation and more important hypo-absorptive component, such as biliopancreatic diversion with duodenal switch (BPD-DS) or one-anastomosis gastric bypass (OAGB), have demonstrated superior weight-loss outcomes compared with SG and RYGB (3,5–14). Along the same lines, to enhance weight loss and metabolic outcomes while simplifying surgical techniques and improving safety profiles, several newer procedures have been described, including among others single-anastomosis duodenal-ileal with SG (SADI-S), SG with Roux-en-Y transit bipartition (SG+TB), and single anastomosis sleeve-ileal transit bipartition (SASI).

These procedures exert their effects through a combination of hypo-absorption and neuroendocrine modulation, including alterations in fibroblast growth factors (FGF)-19 and FGF-21, peptide YY, and enhanced glucagon-like peptide type 1 (GLP-1) secretion via ileal L-cell stimulation (15,16), which contribute to increased satiety, delayed gastrointestinal transit, and enhanced incretin effects, resulting in superior metabolic outcomes. Therefore, these procedures, often grouped under the category of distal (ileal) metabolic bariatric surgeries (DMBS), have been proposed as suitable alternatives (17–19).

However, a major limitation of these newer procedures is that, to date, only SADI-S and its proximal variant, single-anastomosis duodenal-jejunal with SG (SADJ-S), have been formally endorsed procedures by the International Federation for the Surgery and Other Therapies for Obesity (IFSO) (20), and the limited evidence available for some of these remains a major concern. In contrast, BPD-DS and, more recently, OAGB have also received IFSO endorsement (21).

In addition to the latter, despite their increasing adoption, a major limitation remains the lack of standardized definitions and consensus regarding what constitutes a DMBS, including limb length measurements, which surgical procedures should be classified within this category, as well as patient selection, indications, expected outcomes, and safety parameters. Previous efforts to standardize MBS have provided an important framework for procedural nomenclature and reporting (22). However, these recommendations do not specifically address the conceptual definition and classification of DMBS, nor do they fully resolve key areas of variability such as the heterogeneity in limb length configurations, the boundaries between conventional and more hypo-absorptive procedures, and the lack of unified criteria for indications, follow-up protocols, and safety benchmarks. Therefore, in view of these persisting gaps in the literature and the growing global adoption of these procedures, the present Delphi consensus aims to establish agreement among an international panel of expert metabolic bariatric surgeons regarding the definitions, indications, postoperative follow-up, and safety standards of DMBS.

Methods

A Delphi consensus committee, composed of five metabolic bariatric surgeons as non-voting members (XXXXXXX), was established. The committee extended invitations to 51 recognized opinion leaders and highly experienced MBS surgeons. All invitees were recognized for their expertise in performing DMBS. The invited panel included current presidents of national or international metabolic bariatric surgical societies who participated in the consensus-building process. In addition, participating surgeons represented different geographic regions and IFSO chapters, including North America (NAC), Latin America (LAC), Europe (EC), Middle East/North Africa (MENAC), and Asia/Pacific (APC).

The committee drafted 98 statements regarding DMBS that experts would vote on. The statements were organized into three categories: 1) characteristics and types of DMBS procedures (47 statements); 2) indications and patient selection criteria (24 statements), and 3) postoperative follow-up (27 statements) (**Appendix 1**). Before proceeding to the voting stage, all statements underwent a thorough review and modification based on recommendations from expert panel members. These modifications primarily focused on improving clarity, reducing ambiguity, refining terminology, and aligning definitions across statements; no major conceptual changes were introduced at this stage.

Statements were submitted for voting over three rounds using Google Forms®. In accordance with established Delphi methodology, consensus was defined a priori as $\geq 75\%$ agreement (23,24). Individual responses were not analyzed separately. The first online voting round was conducted between September 28, 2025, and October 23, 2025, and the results were shared with all committee and expert panel members.

Statements that did not reach consensus were carefully reviewed and revised according to the committee's and expert panel recommendations. Consequently, a total of 57 statements were submitted for a second online round of voting, conducted between December 3, 2025 and January 5, 2026.

A third round of voting was conducted in person during the Mexican Meeting on Distal (Ileal) Surgeries, held from February 19 to 21, 2026, in Mexico City. This round was performed after dedicated scientific sessions in which current evidence and key technical concepts related to DMBS were reviewed and discussed among participating surgeons. The inclusion of this round aimed to allow voting under conditions of updated, standardized knowledge, thereby reducing variability related to differences in the interpretation of literature. Although participation in this round was limited to board-certified Mexican metabolic bariatric surgeons attending the meeting, all participants that participated had extensive experience in DMBS. This approach was intended to refine areas of persistent disagreement rather than to redefine previously established consensus. During this round, additional 40 board-certified surgeons attending the meeting voted on 21 statements that had reached intermediate agreement levels (60%–74.9%) in prior rounds.

Results

Out of the 51 surgeons invited, 41 (80.4%) surgeons from 16 countries participated in the present study and voted in the initial two rounds. A total of 98 statements were evaluated during the first round,

followed by 57 statements in the second round after refinement.

Among the surveyed experts, the most frequently performed procedures with long BP limbs were SADI-S, followed by distal RYGB and SG+TB, which were performed by 69%, 66.7%, and 50% of participants, respectively. In contrast, the least frequently performed procedures were ileal interposition with sleeve gastrectomy (IISG) and SADJ-S, each reported by only 2.4% of experts. Figure 1 includes detailed data.

A consensus was reached on 55 of 98 (56.1%) statements during the first round. Statements that did not achieve consensus were reviewed and revised based on feedback from the expert panel and subsequently submitted to a second voting round; 6 statements were modified to improve clarity, and 8 new statements were added. Consequently, a total of 51 statements were voted on in the second round. Of these, 16 (31.4%) achieved consensus, 14 did not achieve consensus, and 21 (41.2%) remained within the 60%-74.9% agreement or disagreement range and were therefore submitted to a third voting round among 48 Mexican board-certified metabolic bariatric surgeons, in which a consensus was reached on 10 (45.5%). Tables 1, 2, and 3 summarize the results of the voting rounds.

After the three voting rounds, 12, 11, and 16 statements achieved $\geq 90\%$ agreement across the respective categories.

Regarding definitions, characteristics, and procedural classification, the most relevant statements achieving $\geq 90\%$ agreement were as follows:

1. Gastro-jejunal or duodeno-jejunal bypass procedures should be classified as proximal metabolic procedures (agreed by 92.7% of the experts).
2. Gastro-ileal or duodeno-ileal bypass procedures should be classified as distal metabolic procedures (agreed by 97.6% of the experts).
3. Routine measurement of the total small bowel length is recommended in all DMBS, given its variability and the need to estimate the relative lengths of jejunum and ileum (agreed by 92.1% of the experts).
4. Approximately 40% of the small bowel distal to the ligament of Treitz can be considered jejunum, while the remaining 60% corresponds to ileum for the purposes of surgical classification and standardization (agreed by 92.7% of the experts).
5. Procedures with a common channel ≤ 350 cm should be classified as DMBS procedures, including SADI-S (agreed by 92.9% of the experts), SASI (agreed by 92.9% of the experts), SG+TB (agreed by 90.5% of the experts), and BPD-DS (agreed by 88.1% of the experts).
6. For Single Anastomosis procedures (OAGB, SADI-S, SADJ-S, SASJ, SASI) a common channel of at least 300 cm is recommended (agreed by 92.1% of the experts).

In terms of patient selection and indications, key statements achieving $\geq 90\%$ agreement were as follows:

1. Robust preoperative workup (blood tests, ruling out liver disease, complete cardiopulmonary evaluation) should be performed before performing a DMBS (agreed by 97.6% of the experts)
2. Preoperative multidisciplinary evaluation (psychological and nutritional) should be ensured before a DMBS (agreed by 95.2% of the experts).
3. The patient must understand and be aware of the risks and benefits of a DMBS prior to undergoing surgery (agreed by 100% of the experts).
4. DMBS are suitable as primary MBS for patients with a BMI > 50 with associated metabolic comorbidities (agreed by 97.6% of the experts).
5. DMBS are suitable as primary MBS for patients with a BMI > 60 irrespective of associated metabolic comorbidities (agreed by 90.5% of the experts).
6. DMBS are a viable option for revision due to suboptimal clinical response (SoCR) or RWG, as well as for de novo or relapsing T2DM following restrictive procedures (LAGB, SG) (agreed by 100%, and 97.6% of the experts), or following RYGB (agreed by 97.6%, and 90.5% of the experts, respectively).
7. DMBS should NOT be performed in patients with liver cirrhosis (agreed by 92.9% of the experts).

With respect to postoperative follow-up and surgeons-center specifications, the most relevant statements achieving $\geq 90\%$ agreement were as follows:

1. DMBS should be performed exclusively by experienced surgeons in specialized centers (agreed by 100% of the experts).
2. Efforts should be made to ensure patient follow-up (agreed by 100% of the experts).
3. Postoperative follow-up must involve a multidisciplinary MBS team with specific expertise in DMBS, comprising a psychologist, dietitian and internal medicine specialist (agreed by 90.5% of the experts).
4. Patients should be informed of the increased risk of developing micro- and macronutrient deficiencies in the mid- and long-term (agreed by 97.6% of the experts).
5. Patients should be informed of the increased risk of developing chronic diarrhea (agreed by 95.2% of the experts).
6. Mineral and vitamin supplementation should be higher compared to restrictive or mixed procedures (agreed by 90.5% of the experts).
7. A high protein diet should be ensured in patients undergoing DMBS (agreed by 95.2%).
8. DMBS can achieve adequate outcomes in the control of T2DM, hypertension, dyslipidemia, and weight loss (agreed by 100% of the experts for each outcome).

In terms of contraindications for DMBS, consensus was also reached among the experts regarding patients with end-stage renal disease, inflammatory bowel disease, heart failure, and liver cirrhosis, as previously mentioned above.

Discussion

The adoption of DMBS has increased substantially worldwide; however, this expansion has not been paralleled by standardization in terms of classification, indications, and safety parameters remain limited. In the United States, these procedures rose from 0.7–0.8% (2016–2018) to 2.48–3.11% (2021–2023), according to ASMBS data available on its website (25). Similarly, the IFSO Global Registry reports an increase in procedures beyond SG, RYGB, and LAGB from 4.6% to 8.9% over the same period, reaching 13.2% in revisional procedures in the most recent report (26).

Definitions, characteristics and types of procedures

In the present Delphi consensus, strong agreement was achieved in defining DMBS as procedures involving gastro-ileal or duodeno-ileal bypass, whereas gastro-jejunal or duodeno-jejunal bypass procedures were consistently classified as proximal metabolic operations. Additionally, experts agreed on a pragmatic anatomical approximation in which the first 40% of the small bowel distal to the ligament of Treitz corresponds to the jejunum and the remaining 60% to the ileum for standardization purposes, as previously described (27).

Consistent with these principles, procedures classified as DMBS in the present consensus included OAGB with a BP limb exceeding 50% of the total small bowel length, SADI-S, SASI, and SG+TB with a CC $\leq$ 350 cm, as well as BPD/DS regardless of limb length configuration. In contrast, proximal or distal RYGB, OAGB with fixed limb lengths or a BP limb < 50%, ileal transposition, and proximal variants of SG+TB, SADJ-S, and SASJ were not considered DMBS.

A key finding of this consensus is the lack of agreement regarding optimal limb lengths. In line with this, consensus was reached against defining a fixed maximum CC (e.g., 350 or 400 cm), and experts agreed that classification should not rely on CC length or measurements from the ileocecal valve, reinforcing the concept that purely anatomical definitions may be insufficient to capture the complexity of these procedures. These findings contrast with a previous expert consensus suggesting preservation of at least 300 to 400 cm of CC to reduce the risk of nutritional complications after OAGB (28).

With respect to limb length management, 92% of experts agreed that the entire small bowel should be measured during DMBS, given its considerable variability. Prior studies have reported total small bowel lengths ranging from 450 to 1065 cm, depending on sex and height (29,30). The strong agreement on routine measurement supports a more tailored, patient-specific approach, which may optimize outcomes while minimizing nutritional complications.

Although measuring the entire small bowel has been associated with a modest increase in operative time (7 to 20 minutes) (29,31,32), this difference is not clinically relevant and may contribute to improved outcomes. In this regard, Fair et al. reported that avoiding measurement of total small bowel length, along with the use of a fixed CC < 40%, was associated with significantly higher rates of reoperation (23.7% vs. 1.7%; $p < 0.001$) and late complications (29.3% vs. 3.3%; $p < 0.001$) (32). Also, a previous report on distal RYGB showed that bypassing $\geq$ 70% of the total small bowel length is associated with high rates of protein calorie malnutrition, whereas the configuration of a CC below that threshold seems

to be a safer approach (33). Notably, consensus was also achieved in recommending the avoidance of excessive restriction and hypo-absorption in primary procedures.

Related to the latter, a recent systematic review and meta-analysis evaluating long-term outcomes following BPD/DS, showed that it carries a higher incidence of nutritional deficiencies, particularly for fat-soluble vitamins, anemia, protein malnutrition, and secondary hyperparathyroidism (34).

Another key finding was that consensus was reached in considering that, in transit bipartition procedures (TB+SG and SASI); all limbs correspond to alimentary limbs. However, this finding should be interpreted with caution, since previous studies have reported that up to 43% of patients develop diarrhea, and 23% develop severe malnutrition; and 1 in 5 patients underwent reversal of the index SASI (35,36). Also, gastric emptying scintigraphic studies have shown that 80% of food may pass directly through the gastro-ileostomy (36).

On the other hand, one of the most relevant insights from this consensus is the recognition of ileal stimulation as the cornerstone mechanism underlying DMBS. Rather than relying on the traditional restrictive/hypo-absorptive dichotomy, experts emphasized the role of neuroendocrine modulation, including enhanced incretin secretion and enteroendocrine activation, reflecting the evolution of bariatric surgery toward a more metabolic-oriented discipline.

Accordingly, experts agreed that DMBS should be characterized by their metabolic effects mediated through enteroendocrine stimulation, rather than being defined solely by hypo-absorption and weight loss outcomes, as previously proposed (15,16,18). Although DMBS are recognized to induce greater hypo-absorption and superior weight loss compared to conventional procedures such as SG and RYGB, no consensus was reached on labeling them as “malabsorptive”. This finding supports a paradigm shift away from the traditional ‘malabsorptive’ label toward a physiology-based classification.

Indications and patient selection criteria

Strong consensus was achieved regarding the need for a comprehensive preoperative work-up, multidisciplinary evaluation, and thorough patient counseling on the risks and benefits of DMBS.

Regarding patient selection, consensus supported the use of DMBS as primary procedures in patients with BMI ≥ 40 kg/m² (80.5% without metabolic comorbidities and 85.7% with comorbidities). Notably, agreement increased substantially in patients with higher BMI, reaching 85.7% (without comorbidities) and 97.6% (with comorbidities) for BMI ≥ 50 kg/m², and 90.5% and 95.2%, respectively, for BMI ≥ 60 kg/m². These findings are consistent with prior consensus in patients with class V obesity, in whom more potent metabolic procedures are often required (13,14,37,38). The latter is supported by several studies, in which either OAGB, SADI-S, and BPD-DS have demonstrated superior weight loss in comparison to SG and RYGB (3,7–13,39–42).

Strong consensus ($\geq 90\%$ agreement) was also achieved regarding the use of DMBS as revisional procedures in cases of SoCR or RWG, as well as in the presence of de novo or relapsing T2DM following

SG, LAGB, or RYGB.

These findings are consistent with the available literature. For instance, a recent retrospective study demonstrated that revisional SADI-S achieved superior weight loss compared to revisional RYGB at 1 year, with sustained differences at 5 and 7 years, showing a mean difference in percentage of total weight loss (%TWL) of 8% ($p = 0.001$) and 6.4% ($p = 0.001$), respectively (43). Additionally, patients undergoing SADI-S exhibited significantly improved lipid profiles during follow-up, as well as a trend toward lower HbA1c levels. However, some nutritional parameters, including zinc, vitamin D, and folate, were significantly lower in the SADI-S group (43).

Comparable findings have been reported for BPD/DS versus RYGB, with the former achieving a greater %TWL difference of approximately 8%, sustained for up to 15 years (44). Importantly, in terms of safety, DMBS as revisional procedures have demonstrated perioperative complication rates comparable to other revisional techniques and remain overall low (20,43,45–47).

On the other hand, the experts reached a consensus against performing DMBS in patients with liver cirrhosis, end-stage kidney disease, end-stage congestive heart failure, and inflammatory bowel disease. Avoiding DMBS in patients with liver disease was of particular interest. Although rare, acute liver failure has been reported, particularly in the context of excessive hypo-absorption and severe protein-calorie malnutrition (48–50). Proposed mechanisms include rapid weight loss, excessive hypo-absorption, small intestinal bacterial overgrowth, preoperative deficiencies, and increased intestinal permeability leading to hepatocellular injury (51). Notably, liver disease progression or acute liver failure are more frequently associated with procedures involving very short CC or unmeasured small bowel lengths, reinforcing the importance of individualized limb length tailoring.

Postoperative follow-up

The present consensus highlights the critical importance of specialized care in the implementation of DMBS. The unanimous agreement that exclusively experienced surgeons in high-volume centers should perform these procedures underscores their technical complexity and the need for structured programs, aligning with existing ASMBS and IFSO recommendations. These findings reinforce those of a previous survey study in which metabolic bariatric surgeons considered that BPD/DS to be an effective procedure; however, it was performed by only 36% of them due to concerns regarding high long-term complication rates, lack of training, and patient reluctance toward the procedure (52).

Similarly, the strong consensus on mandatory postoperative follow-up and multidisciplinary management reflects the recognition that outcomes after DMBS are highly dependent on long-term patient engagement and specialized care. Importantly, although these considerations are particularly relevant in DMBS due to their greater hypo-absorptive component, experts emphasized that rigorous postoperative follow-up, nutritional surveillance, and multidisciplinary management should be considered essential in all metabolic bariatric procedures to optimize long-term outcomes and minimize complications.

Notably, experts emphasized the increased risk of micro- and macronutrient deficiencies, the need for intensified supplementation, and the importance of maintaining a high-protein diet, reinforcing the concept that enhanced metabolic efficacy is accompanied by greater nutritional demands, as supported by previous guidelines and statements (13,20,21,53). A recent review highlighted that the metabolic benefits achieved with hypo-absorptive procedures must be carefully balanced against the increased risk of protein-calorie malnutrition and micronutrient deficiencies (13). In addition, the high agreement regarding the risk of chronic diarrhea highlights the relevance of functional outcomes and quality of life, which should be systematically addressed during preoperative counseling.

Strengths and limitations

The strengths of this study include the participation of a large, internationally representative panel of expert metabolic bariatric surgeons and the systematic methodology inherent to the Delphi process. To the best of our knowledge, this is the first consensus specifically aimed at defining what constitutes a distal or ileal metabolic bariatric procedure (DMBS), as well as providing a structured framework for procedural classification and recommendations regarding indications and safety.

However, several limitations must be acknowledged. As with all Delphi studies, the results are based on expert opinion, which represents a lower level of evidence. Furthermore, the current body of literature in this field is largely composed of case series and case-control studies, with a paucity of randomized controlled trials, limiting the strength of the available evidence. Additionally, the limited availability of high-quality comparative data for some procedures restricts the ability to generate definitive clinical recommendations.

Finally, an important limitation is that the third voting round included only Mexican board-certified metabolic and bariatric surgeons attending a national meeting. Although these participants had extensive DMBS experience, was preceded by an extensive literature review, and the round was intended to refine statements with intermediate agreement, this may have introduced geographic and selection bias and may limit the international generalizability of the final consensus for those statements.

The field of DMBS is transitioning from a heterogeneous group of innovative procedures to a more structured and physiology-driven field. This Delphi consensus represents a critical step toward that evolution by establishing, for the first time, a globally informed framework for definition, classification, and clinical application. Importantly, it highlights that the future of MBS will not be defined solely by technical variation, but by a deeper understanding of intestinal physiology and metabolic modulation. As such, these findings provide a foundation for harmonizing clinical practice, guiding future research, and ultimately improving patient safety and outcomes.

Conclusion

In conclusion, distal (ileal) metabolic bariatric surgeries (DMBS) should be regarded as highly effective yet physiologically demanding procedures that require careful patient selection, individualized surgical

planning, and strict long-term follow-up.

Overall, this consensus does not aim to promote or endorse specific procedures, but rather to clearly define which procedures can be classified as distal or ileal techniques. In doing so, it intends to protect patients and establish a common language that enables the advancement of DMBS with greater scientific rigor and global responsibility.

This Delphi consensus recommends routine measurement of total small bowel length, supporting a tailored approach in the absence of consensus on fixed limb lengths. It also suggests that DMBS are particularly indicated in patients with severe obesity (BMI >40 kg/m² and comorbidities, or BMI ≥50–60 kg/m² irrespective of the presence of comorbidities) and in the revisional setting, where greater metabolic efficacy is required.

Abbreviations

BMI: Body Mass Index

BP: Bilio-pancreatic

BPD/DS: Biliopancreatic Diversion with Duodenal Switch

CC: Common channel

DMBS: Distal Metabolic Bariatric Surgeries

EWL: Excess Body Weight Loss

GERD: Gastro esophageal Reflux Disease

IISG: Ileal Interposition with Sleeve Gastrectomy

LAGB: Laparoscopic Adjustable Gastric Band

MASLD: Metabolic Dysfunction-Associated Steatotic Liver Disease

MBS: Metabolic Bariatric Surgery

OAGB: One Anastomosis Gastric Bypass

RWG: Recurrent Weight Gain

RYGB: Roux en-Y Gastric Bypass

SADI-S: Single Anastomosis Duodenal-Ileal Bypass with Sleeve Gastrectomy

SADJ-S: Single Anastomosis Duodenal-Jejunal Bypass with Sleeve Gastrectomy

SASI: Single Anastomosis Sleeve-Ileal Transit Bipartition

SASJ: Single Anastomosis Sleeve-Jejunal Transit Bipartition

SG: Sleeve Gastrectomy

SG+TB: Sleeve Gastrectomy with Roux-en-Y Transit Bipartition

SoCR: Suboptimal Clinical Response

T2DM: Type 2 Diabetes Mellitus

TALL: Total Alimentary Limb Length

TB: Transit Bipartition

TWL: Total Weight Loss

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Tables

Table 1. Characteristics and types of Distal metabolic and bariatric surgeries (DMBS)				
Statement	First-round, Experts' Result (%)	Second-round, Experts' Result (%)	Third-round, National Board-Certified Surgeons	Outcome
1. Gastro-jejunal or duodeno-jejunal bypass procedures should be classified as proximal metabolic procedures		Agree, 92.7%		Consensus
2. Gastro-ileal or duodeno-ileal bypass procedures should be classified as distal metabolic procedures		Agree, 97.6%		Consensus
3. DMBS aim to stimulate enteroendocrine cells and produce a significant metabolic effect, regardless of weight loss	Agree, 88.1%			Consensus
4. First round: DMBS aim to induce greater hypoabsorption and result in significant and sustained weight loss Second round: DMBS aim to induce greater hypoabsorption and result in significant and sustained weight loss in comparison to the most frequently performed procedures (E.g. SG, RYGB)	Agree, 71.4%	Agree, 85.4%		Consensus
5. DMBS should not be labeled as malabsorptive procedures	Agree, 71.4%	Agree, 70.7%	Agree, 52.6%	No-Consensus
6. First round: Routine measurement of the total small bowel length is recommended in all DMBS Second round: Routine measurement of the total small bowel length is recommended in all DMBS, given its variability and the need to estimate the relative lengths of jejunum and ileum	Agree, 73.8%	Agree: 73.2%	Agree, 92.1%	Consensus
7. Measurement of the small bowel should be performed from distal to proximal, starting at the	Agree, 81%			Consensus

ileocecal valve, to ensure an adequate common channel length				
8. Approximately 40% of the small bowel distal to the ligament of Treitz can be considered jejunum, while the remaining 60% corresponds to ileum for the purposes of surgical classification and standardization.		Agree, 92.7%		Consensus
9. The shorter the common channel, the greater the entero-hormonal effect achieved, at expense a higher risk of nutritional deficiencies		Agree, 87.8%		Consensus
10. A minimum biliopancreatic limb length of 150 cm is required to define a DMBS	Disagree, 73.8%	Disagree, 65.9%	Disagree, 84.2%	Consensus
11. A minimum biliopancreatic limb length of 200 cm is required to define a DMBS	Disagree, 81%			Consensus
12. At least 40% of the total small bowel length as the biliopancreatic limb (Common channel or Total Alimentary Limb Length < 60%) is required to define a DMBS	Disagree, 64.3%	Disagree, 58.5%		No-Consensus
13. At least 50% of the total small bowel length as the biliopancreatic limb (Common channel or Total Alimentary Limb Length < 50%) is required to define a DMBS	Disagree, 61.9%	Disagree, 70.7%	Disagree, 73.7%	No-consensus
14. At least 60% of the total small bowel length as the biliopancreatic limb (Common channel or Total Alimentary Limb Length < 40%) is required to define a DMBS	Disagree, 83.3%			Consensus
15. The definition of a DMBS should not be based on the BP Limb Length or Treitz-based measurements		Agree, 68.3%	Agree, 71.1%	No-Consensus

16. First round: A maximum of 300 cm of common channel is required to define a DMBS, irrespective of the total small bowel length Second round: A maximum of 300 cm of common channel or total alimentary limb length is required to define a DMBS, irrespective of the total small bowel length	Disagree, 54.8%	Disagree, 51.2%		No-Consensus
17. A maximum of 350 cm of common channel is required to define a DMBS, irrespective of the total small bowel length	Disagree, 92.9%			Consensus
18. A maximum of 400 cm of common channel is required to define a DMBS, irrespective of the total small bowel length	Disagree, 85.7%			Consensus
19. The definition of a DMBS should not be based on the CC limb length or on measurements from the ileocecal valve.		Disagree, 63.4%	Disagree, 92.1%	Consensus
20. Fixed common channel limb lengths are preferable to use instead of tailored limb lengths	Disagree, 59.5%	Disagree, 73.2%	Disagree, 60.5%	No-Consensus
21. Tailored common channel limb lengths are preferable to use instead of fixed common channel limb lengths	Agree, 61.9%	Agree, 73.2%	Agree, 71.1%	No-Consensus
22. The terms common channel and efferent limb may be used interchangeably in single-anastomosis procedures	Agree, 69%	Agree, 82.9%		Consensus
23. It is preferable to use the term efferent limb instead of common channel in those single-anastomosis procedures	Disagree, 61.9%	Disagree, 70.7%	Disagree, 52.6%	No-Consensus
24. It is preferable to use the term common channel instead of efferent limb in those single-anastomosis procedures	Disagree, 61.9%	Disagree, 53.7%		No-Consensus

25. Conventional Roux-en-Y Gastric Bypass (BP limb < 100 cm, Alimentary limb < 150 cm) is NOT considered a DMBS	Agree, 95.2%			Consensus
26. Long Alimentary Limb Roux-en-Y Gastric Bypass (Alimentary limb > 150 cm) with short Biliopancreatic limb (< 100 cm) is considered a DMBS	Disagree, 78.6%			Consensus
27. Long Biliopancreatic Limb Roux-en-Y Gastric Bypass (BP limb > 150 cm) irrespective of the Alimentary limb length is considered a DMBS	Agree, 73.8%	Disagree, 78%		Consensus
28. Standardized One-Anastomosis Gastric Bypass (OAGB) (BP Limb ≤ 200 cm) is considered a DMBS	Disagree, 85.7%			Consensus
29. Standardized One-Anastomosis Gastric Bypass (OAGB) (BP Limb at least 200 cm) is considered a DMBS	Disagree, 61.9%	Disagree, 75.6%		Consensus
30. First round: Tailored One-Anastomosis Gastric Bypass (OAGB) (BP Limb ≥40%) is considered a DMBS Second round: Tailored One-Anastomosis Gastric Bypass (OAGB) with a BP Limb of 40% (Common channel or Total Alimentary Limb Length of 60%) is considered a DMBS	Agree, 59.5%	Disagree, 51.2%		No-Consensus
31. First round: Tailored One-Anastomosis Gastric Bypass (OAGB) (BP Limb ≥50%) is considered a DMBS Second round: Tailored One-Anastomosis Gastric Bypass (OAGB) with a BP Limb of 50% (Common channel or Total Alimentary Limb Length of 50%) is considered a DMBS	Agree, 64.3%	Agree, 65.9%	Agree, 84.2%	Consensus
32. First round: Tailored One-Anastomosis Gastric Bypass	Agree, 71.4%	Agree, 75.6%		Consensus

(OAGB) (BP Limb $\geq 60\%$) is considered a DMBS			
Second round: Tailored One-Anastomosis Gastric Bypass (OAGB) with a BP Limb $\geq 60\%$ (Common channel or Total Alimentary Limb Length $< 40\%$) is considered a DMBS			
33. One-Anastomosis Gastric Bypass (OAGB) should NEVER be considered a DMBS, irrespective of the length of BP limb		Disagree, 90.2%	Consensus
34. Single Anastomosis Duodeno-Jejunal bypass (SADJ-S) (BP Limb ≤ 200 cm) + Sleeve Gastrectomy is considered a DMBS	Disagree, 78.6%		Consensus
35. Single Anastomosis Duodeno-Ileal bypass (SADI-S) (Common channel ≤ 350 cm) + Sleeve Gastrectomy is considered a DMBS	Agree, 92.9%		Consensus
36. Biliopancreatic diversion with duodenal switch (BPD-DS) is considered a DMBS, irrespective of the common channel length	Agree, 88.1%		Consensus
37. Single Anastomosis Sleeve-Jejunal Transit Bipartition (SASJ) (BP Limb ≤ 200 cm) is considered a DMBS	Disagree, 69%	Disagree, 78%	Consensus
38. Single Anastomosis Sleeve-Ileal Transit Bipartition (SASI) (Common channel ≤ 350 cm) is considered a DMBS	Agree, 92.9%		Consensus
39. Jejunal Transit Bipartition (Roux-en-Y configuration) (BP Limb ≤ 200 cm) + Sleeve Gastrectomy is considered a DMBS	Disagree, 64.3%	Disagree, 75.6%	Consensus
40. Ileal Transit Bipartition (Roux-en-Y configuration) (Common channel ≤ 350 cm) + Sleeve Gastrectomy is considered a DMBS	Agree, 90.5%		Consensus

41. Ileal interposition + Sleeve Gastrectomy is considered a DMBS, irrespective of the common channel length	Agree, 66.7%	Agree, 53.7%		No-Consensus
42. Ileal interposition without Sleeve Gastrectomy is considered a DMBS, irrespective of the common channel length	Agree, 50%	Disagree, 51.2%		No-Consensus
43. For DMBS Roux en Y procedures (Distal RYGB, BPD/DS) a total alimentary limb length (TALL) of at least 300 cm is recommended	Disagree, 61.9%	Disagree, 53.7%		No-Consensus
44. For DMBS Roux en Y procedures (Distal RYGB, BPD/DS) a total alimentary limb length (TALL) of at least 350 cm is recommended	Disagree, 85.7%			Consensus
45. For DMBS Roux en Y procedures (Distal RYGB, BPD/DS) a total alimentary limb length (TALL) of at least 400 cm is recommended	Disagree, 52.4%	Disagree, 51.2%		No-Consensus
46. In Transit Bipartition (TB) procedures, all limbs correspond to alimentary limbs, regardless of the percentage of food exposure	Agree, 66.7%	Agree, 70.7%	Agree, 84.2%	Consensus
47. For SG+TB a total common limb of at least 200 cm is recommended	Disagree, 83.3%			Consensus
48. For SG+TB a total common limb of at least 250 cm is recommended	Disagree, 66.7%	Disagree, 58.5%		No-Consensus
49. For SG+TB a total common limb of at least 300 cm is recommended	Agree, 54.8%	Agree, 53.7%		No-Consensus
50. For Single Anastomosis procedures (OAGB, SADI-S, SADJ-S, SASJ, SASI) a common channel of at least 250 cm is recommended	Disagree, 57.1%	Disagree, 56.1%		No-Consensus

51. For Single Anastomosis procedures (OAGB, SADI-S, SADI-S, SASJ, SASI) a common channel of at least 300 cm is recommended	Agree, 59.5%	Agree, 61%	Agree, 92.1%	Consensus
52. For Single Anastomosis procedures (OAGB, SADI-S, SADI-S, SASJ, SASI) a common channel of at least 350 cm is recommended	Disagree, 85.7%			Consensus
53. In Pylorus sparing procedures shorter than 300 cm of common channel lengths can be used	Agree, 66.7%	Agree, 68.3%	Agree, 60.5%	No-Consensus
54. In Pylorus sparing procedures shorter than 250 cm of common channel lengths can be used	Disagree, 81%			Consensus
55. During primary procedures, it is recommended to avoid combining significant restriction with significant hypoabsorption		Agree, 82.9%		Consensus

Table 2. Patient indications and selection criteria				
Statement	First-round, Experts' Result (%)	Second-round, Experts' Result (%)	Third-round, National Board-Certified Surgeons	Outcome
1. Robust preoperative work up (blood tests, ruling out liver disease, complete cardiopulmonary evaluation) should be performed before performing a DMBS	Agree, 97.6%			Consensus
2. Preoperative multidisciplinary evaluation (psychological and nutritional) should be ensured before a DMBS	Agree, 95.2%			Consensus
3. The patient must understand and be aware of the risks and benefits of a DMBS prior undergoing the surgery	Agree, 100%			Consensus
4. DMBS are suitable as primary MBS for patients with a BMI between 35 and 39.9 kg/m ² without associated metabolic comorbidities (Type 2 Diabetes, Hyperlipidemia...)	Disagree, 71.4%	Disagree, 70.7%	Disagree 81.2%	Consensus
5. DMBS are suitable as primary MBS for patients with a BMI between 35 and 39.9 kg/m ² with associated metabolic comorbidities (Type 2 Diabetes, Hyperlipidemia...)	Agree, 73.8%	Agree, 75.6%		Consensus
6. DMBS are suitable as primary MBS for patients with a BMI between 40 and 49.9 kg/m ² without associated metabolic comorbidities (Type 2 Diabetes, Hyperlipidemia...)	Agree, 64.3%	Agree, 80.5%		Consensus
7. DMBS are suitable as primary MBS for patients with a BMI between 40 and 49.9 kg/m ² with associated metabolic comorbidities (Type 2 Diabetes, Hyperlipidemia...)	Agree, 85.7%			Consensus

8. DMBS are suitable as primary MBS for patients with a BMI > 50 without associated metabolic comorbidities (Type 2 Diabetes, Hyperlipidemia...)	Agree, 85.7%	Consensus
9. DMBS are suitable as primary MBS for patients with a BMI > 50 with associated metabolic comorbidities (Type 2 Diabetes, Hyperlipidemia...)	Agree, 97.6%	Consensus
10. DMBS are suitable as primary MBS for patients with a BMI > 60 without associated metabolic comorbidities (Type 2 Diabetes, Hyperlipidemia...)	Agree, 90.5%	Consensus
11. DMBS are suitable as primary MBS for patients with a BMI > 60 with associated metabolic comorbidities (Type 2 Diabetes, Hyperlipidemia...)	Agree, 95.2%	Consensus
12. DMBS are a viable option for revision due to suboptimal clinical response or recurrent weight gain following restrictive procedures (LAGB, SG)	Agree, 100%	Consensus
13. DMBS are a viable option for revision due to suboptimal clinical response or recurrent weight gain following Roux-en-Y Gastric Bypass (RYGB)	Agree, 97.6%	Consensus
14. DMBS are a viable option for revision due to de novo type 2 Diabetes Mellitus or relapse following restrictive procedures (LAGB, SG)	Agree, 97.6%	Consensus
15. DMBS are a viable option for revision due to de novo type 2 Diabetes Mellitus or relapse following RYGB	Agree, 90.5%	Consensus
16. DMBS should NOT be performed in patients with liver cirrhosis	Agree, 92.9%	Consensus

17. DMBS should NOT be performed in patients with end-stage kidney disease	Agree, 76.2%			Consensus
18. DMBS could be performed in patients with end-stage congestive heart failure	Agree, 52.4%	Disagree, 63.4%	Disagree 83.3%	Consensus
19. DMBS could be performed in patients with end-stage pulmonary disease	Disagree, 54.8%	Disagree, 56.1%		No-Consensus
20. DMBS should NOT be performed in patients with previous solid organ transplant (heart, lung, kidney, liver)	Agree, 52.4%	Agree, 63.4%	Agree, 60.4%	No-Consensus
21. DMBS should NOT be performed in patients with inflammatory bowel disease	Agree, 88.1%			Consensus
22. Pylorus Sparing DMBS with Sleeve Gastrectomy (BPD/DS, SADI-S, SADJ-S) are NOT recommended in patients with gastroesophageal reflux disease (GERD)	Agree, 57.1%	Agree, 63.4%	Agree, 72.9%	No-Consensus
23. Gastro-enteral derivative procedures (SASI, SASJ, SG+TB) are suitable in patients with gastroesophageal reflux disease (GERD)	Agree, 69%	Agree, 70.7%	Disagree, 66.7%	No-Consensus
24. Procedures that include sleeve gastrectomy (BPD/DS, SADI-S, SADJ-S, SASI, SASJ, SG+TB) are NOT recommended in patients with gastroesophageal reflux disease (GERD)	Agree, 54.8%	Disagree, 51.2%		No-Consensus

Table 3. Postoperative follow-up				
Statement	First-round, Experts' Result (%)	Second-round, Experts' Result (%)	Third-round, National Board-Certified Surgeons	Outcome
Statement	Agree (%)	Disagree (%)		Consensus
1. DMBS should be performed exclusively by experienced surgeons in specialized centers	Agree, 100%			Consensus
2. Efforts should be made to ensure patient follow-up	Agree, 100%			Consensus
3. Efforts should be made to ensure patient follow-up at least 1 year.	Agree, 66.7%	Agree, 58.5%		No-Consensus
4. Efforts should be made to ensure patient follow-up at least 2 years	Agree, 66.7%	Agree, 95.1%		Consensus
5. Efforts should be made to ensure patient follow-up at least 3 to 5 years	Agree, 83.3%			Consensus
6. Efforts should be made to ensure patient lifetime follow-up	Agree, 88.1%			Consensus
7. Postoperative follow-up must involve a multidisciplinary MBS team with specific expertise in DMBS, comprising a psychologist, dietitian, internal medicine specialist	Agree, 90.5%			Consensus
8. DMBS are associated with a higher incidence of micronutrient and vitamin deficiencies compared to other bariatric and metabolic procedures	Agree, 78.6%			Consensus
9. DMBS are associated with a higher incidence of hypoalbuminemia and malnutrition compared to other bariatric and metabolic procedures	Agree, 81%			Consensus
10. Patients should be informed of the increased risk of developing micro- and macronutrient deficiencies in the mid- and long-term	Agree, 97.6%			Consensus
11. Patients should be informed of the increased risk of developing chronic	Agree, 95.2%			Consensus

diarrhea				
12. Mineral and vitamin supplementation should be higher compared to restrictive or mixed procedures	Agree, 90.5%			Consensus
13. Bipartitional procedures (SG+TB, SASI, SASJ) may require lower mineral and vitamin supplementation compared to other DMBS, due to the preservation of the duodenum and proximal jejunum	Agree, 76.2%			Consensus
14. A high protein diet should be ensured in patients undergoing DMBS	Agree, 95.2%			Consensus
15. Routine blood tests are recommended at least every 3 months following any DMBS	Disagree, 65.1%	Agree, 65.9%	Agree, 87.5%	Consensus
16. Routine blood tests are recommended at least every 6 months following any DMBS	Agree, 76.2%			Consensus
17. Routine blood tests are recommended at least every 12 months following any DMBS	Agree, 61.9%	Agree, 73.2%	Agree, 77.1%	Consensus
18. A high-protein diet and increased mineral and vitamin supplementation is the first-line approach when malnutrition or hypoproteinemia is identified following a DMBS	Agree, 100%			Consensus
19. Increasing the total alimentary limb (TALL) (common channel + alimentary/Roux limb) length is an appropriate treatment for patients with malnutrition or severe mineral or vitamin deficiencies are refractory to dietary adjustments following a DMBS	Agree, 85.7%			Consensus
20. Dismantling or transection of the gastroileal anastomosis is an appropriate treatment for patients with malnutrition or severe mineral	Agree, 97.6%			Consensus

or vitamin deficiencies who have undergone bipartitional procedures (SG+TB, SASI, SASJ)				
21. Endoscopic suture closure of the gastroileal anastomosis is an appropriate treatment for patients with malnutrition or severe mineral or vitamin deficiencies who have undergone bipartitional procedures (SG+TB, SASI, SASJ)	Agree, 59.5%	Agree, 70.7%	Agree, 66.7%	No-Consensus
22. DMBS can achieve adequate results in the control of T2DM	Agree, 100%			Consensus
23. DMBS can achieve adequate results in the control of blood pressure	Agree, 100%			Consensus
24. DMBS can achieve adequate results in the control of lipid levels	Agree, 100%			Consensus
25. DMBS can achieve adequate results in the control of obstructive sleep apnea	Agree, 100%			Consensus
26. DMBS can achieve adequate weight loss outcomes at short-term follow-up	Agree, 95.2%			Consensus
27. DMBS can achieve adequate weight loss outcomes at medium-term follow-up	Agree, 100%			Consensus

Figures

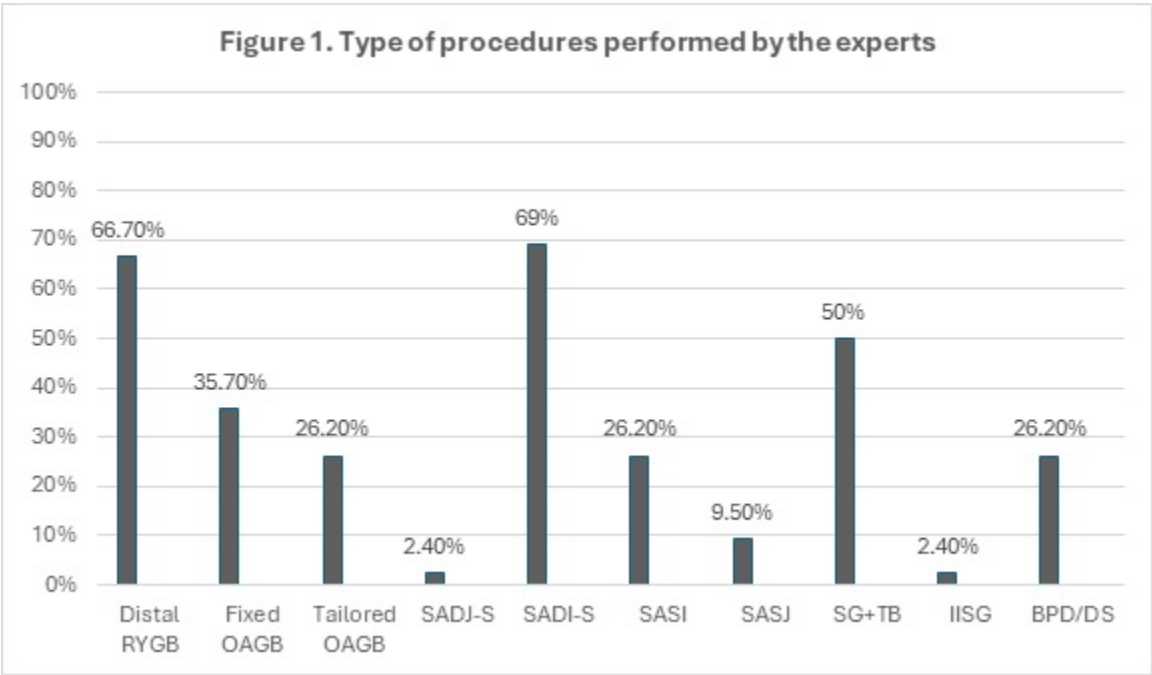


Figure 1

Type of procedures performed by the experts

Supplementary Files

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- [Supplementarymaterial.docx](#)