Despite increasing recognition of the efficacy, safety, and cost-effectiveness of bariatric/metabolic surgery in the treatment of type 2 diabetes, few patients who may be appropriate candidates and may benefit from this type of surgery avail themselves of this treatment option. To identify conceptual and practical barriers to appropriate use of surgical procedures, a Policy Lab was hosted at the 3rd World Congress on Interventional Therapies for Type 2 Diabetes on 29 September 2015. Twenty-six stakeholders participated in the Policy Lab, including academics, clinicians, policy-makers, industry leaders, and patient representatives. Participants were provided with a summary of available evidence about the cost-effectiveness of bariatric/metabolic surgery and the costs of increasing the use of bariatric/metabolic surgery, using U.K. and U.S. scenarios as examples of distinct health care systems. There was widespread agreement among this group of stakeholders that bariatric/metabolic surgery is a legitimate and cost-effective approach to the treatment of type 2 diabetes in obese patients. The following four building blocks were identified to facilitate policy changes: 1) communicating the scale of the costs and harms associated with rising prevalence of type 2 diabetes; 2) properly articulating the role of bariatric/metabolic surgery for certain population groups; 3) identifying new funding sources for bariatric/metabolic surgery; and 4) incorporating bariatric/metabolic surgery into the appropriate clinical pathways. Although more research is needed to identify specific clinical scenarios for the prioritization of bariatric/metabolic surgery, the case appears to be strong enough to engage relevant policy-makers and practitioners in a concerted discussion of how to better use metabolic surgical resources in conjunction with other interventions in good diabetes practice.

Type 2 diabetes comprises 90% of the total number of diabetes cases around the world (1). According to the most recent estimates by the International Diabetes Federation, 8.3% of adults in the world—382 million people—currently have diabetes, and the number is set to rise beyond 592 million in <25 years (2). The disease is a leading cause for myocardial infarction, stroke, blindness, kidney failure, and amputations (3). Because of its costly complications, diabetes places a significant financial burden on national health care systems.

In cases where treatment with diet, exercise, and medications have proved to be insufficient, bariatric/metabolic surgery can be an alternative and/or additional treatment for obesity and type 2 diabetes (4). In fact, many of the patients who undergo this type of surgery enjoy sustained remission of the disease, which is generally considered irreversible and inevitably progressive. Randomized clinical trials demonstrate that...
bariatric/metabolic surgery can achieve better control of hyperglycemia and greater reduction of cardiovascular risk factors compared with conventional medical therapies and lifestyle interventions (5,6). However, despite increasing recognition of the efficacy, safety, and cost-effectiveness of bariatric/metabolic surgery, there appear to be numerous potential barriers to the appropriate use of surgical procedures for those patients who may benefit.

To address the challenges and opportunities that bariatric/metabolic surgery offers to diabetes care and research, the World Congress on Interventional Therapies for Type 2 Diabetes was set up as an international forum where clinicians, scientists, and policy-makers discuss the available evidence on the use and study of bariatric/metabolic surgery and new device-based interventions. The third congress in this series was held in September 2015 in London to critically discuss the latest evidence on bariatric/metabolic surgery, including clinical outcomes, mechanisms of action, and implications for health care policies (7). A specific aim of the congress was to identify and address potential barriers that may prevent access to surgical treatment of obesity and diabetes in eligible patients.

The Policy Institute at King’s College London was invited to undertake a Policy Lab exercise during the congress, with the intent to bring together clinicians, academics, senior policy officials, and patient representatives. The specific goals of the Policy Lab included the following: 1) to provide the latest evidence on the cost-effectiveness of bariatric/metabolic surgery as a treatment option for obesity and diabetes; 2) to identify barriers to the appropriate use of bariatric/metabolic surgery as part of the mix of interventions to address the rising burden of type 2 diabetes; and 3) to develop health policy initiatives that may improve access to surgical treatment when indicated. Policy Lab participants were provided with a summary of available evidence on the cost-effectiveness of bariatric/metabolic surgery and the costs of increasing the proportion of patients who would be appropriate candidates to undergo bariatric/metabolic surgery procedures. This article is structured as follows. First, we describe the Policy Lab. Second, we present the existing evidence on the global health care costs of diabetes, the evidence on the cost-effectiveness of bariatric/metabolic surgery, and our own calculations of the costs and benefits of meeting the potential demand for bariatric/metabolic bariatric surgery in England and the U.S. based on published data. Third, we report the views expressed by participants in the Policy Lab and the relevant policy implications that emerged.

WHAT IS A POLICY LAB?
Making decisions about health care policies is a complex task and can require an understanding of the needs of the target communities; of the evidence base for a range of available interventions; and an assessment of the attitudinal, resource, and logistical contexts that can affect the implementation of such policies. We prepared a Policy Lab (8) in which individuals of appropriate expertise debated the available scientific evidence and identified effective means by which such evidence can inform policy and practice. The Policy Lab brought together 26 stakeholders, including academics, clinicians, policy-makers, industry leaders, and patient representatives, with the goal of discussing bariatric/metabolic surgery as a treatment option for type 2 diabetes and the potential barriers to increased access to its use in practice (Fig. 1).

Prior to the meeting, the organizing committee and the moderators of the Policy Lab researched the available evidence, and summarized data about the current cost of diabetes for health care systems, the clinical effectiveness, and cost-effectiveness of bariatric/metabolic surgery for type 2 diabetes, and its use in high-income countries. We also assessed the number of potentially eligible patients who currently have access to bariatric/metabolic surgery in two countries, England and the U.S., as examples of two distinct types of health care systems, and estimated the costs and benefits of increasing the access to the surgery. These data were summarized and presented to participants of the Policy Lab during the congress. Participants considered the case for an increased provision of bariatric/metabolic surgery to help address the challenge of type 2 diabetes. Specifically, they were asked to identify obstacles to increasing the use of bariatric/metabolic surgery and to propose actions that could help overcome such obstacles.

THE GLOBAL HEALTH CARE COST OF DIABETES
In 2015, the global health care cost of diabetes was estimated to be $673 billion, or 12% of all global health care costs, but health care expenditures for diabetes vary dramatically by region and by country (2). The world’s richest regions, North America and Europe, account for 75% of global health care expenditures for diabetes. In the U.S., the mean annual health care expenditures per person with diabetes are $10,942 and in the U.K., they are $4,373 (2) (and are estimated to account for 10% of the National Health Service budget [9]). Assuming constant per capita health care expenditures for diabetes, the global cost of diabetes is projected to increase by 19% to $802 billion by 2040 (2). The reasons for the increasing costs of diabetes include population growth, aging of the population, and increasing prevalence of diabetes.

Economic development is associated with increased access to health care and increased per capita health care expenditures. In high-income countries, substantial resources are used for antihyperglycemic therapy, blood pressure, and lipid-lowering therapies, and for treatment of the complications and comorbidities of diabetes. In low- and middle-income countries, a greater proportion of resources is used for antihyperglycemic therapy, and a lower proportion is used for the treatment of chronic complications and comorbidities (10). With economic development, more individuals receive antihyperglycemic therapy and treatment for cardiovascular risk factors, complications, and comorbidities. A recent global systematic review (10) revealed that the direct costs of diabetes are closely and positively
associated with the per capita gross domestic product (GDP) of a country, such that every additional dollar in per capita GDP corresponds with an average increase in diabetes expenditures of ~4 U.S. cents. Treatment for late and expensive complications of diabetes, such as end-stage renal disease, have also been shown to be strongly associated with national economic wealth or GDP. In low- and middle-income countries, end-stage renal disease treatment rates are negligible or extremely low (11). Treatment rates increase progressively with GDP per capita, and are substantially larger in high-income countries. These data suggest that with global economic growth, access to care and the increase in health care costs attributable to diabetes and its complications will be substantially greater than those hitherto projected and will be unsustainable unless action is taken to slow the epidemic of type 2 diabetes. There is an urgent need to implement interventions to delay or prevent the development of type 2 diabetes, and to slow the progression of its complications and comorbidities.

COST-EFFECTIVENESS OF BARIATRIC/METABOLIC SURGERY FOR PATIENTS WITH TYPE 2 DIABETES

For the Policy Lab, evidence was gathered from two recent systematic reviews, which included international evidence on the cost-effectiveness of bariatric/metabolic surgery in people with type 2 diabetes who are also obese (Table 1). The reviews were commissioned by the U.K. National Institute for Health Research Health Technology Assessment program (12) and the National Clinical Guidelines Centre (NCGC) and were published in 2009 and 2015. Across both reviews, four studies were identified that met the NCGC quality criteria (13–16) (eight further economic evaluations were excluded based on grounds of quality or scope by the NCGC). All four studies used probabilistic decision analytic modeling to estimate the incremental costs and benefits of bariatric/metabolic surgery when compared with nonsurgical management in patients with type 2 diabetes in periods of up to 40 years. Modeled populations lived in Australia (16), the U.K. (13,14), and the U.S. (15).

Input data on clinical effectiveness, including diabetes remission rates, typically came from published randomized controlled trials (RCTs) that had a maximum of 2 years of follow-up (17,18). Input data on costs came from relevant literature or providers of health system information, including the U.K. Health and Social Care Information Centre. Three of the studies concluded that bariatric/metabolic surgery had a very high likelihood (95–100%) of being cost-effective within any reasonable threshold of what would be considered value for money in health care (in the context of a high-income country). Nevertheless, there was considerable variability in the estimated incremental cost-effectiveness ratios (ICERs) between studies, because of differences in the modeling approach, input parameters, and assumptions made. The fourth study concluded that bariatric/metabolic surgery dominated the nonsurgical comparator, in that it was both less costly and more effective.

For obese patients with established diabetes, a U.S. study by Hoerger et al. (15) reported an ICER of $13,000 per quality-adjusted life-year (QALY) for banding surgery and $12,000 per QALY for bypass surgery (both were compared with nonsurgical management over a lifetime). Relative to patients with established diabetes, bariatric surgery led to more life-years and lower ICERs in patients with newly diagnosed diabetes ($11,000 for banding surgery and $7,000 for bypass surgery). (In the study by Hoerger et al. [15], all costs were reported in 2005 U.S. dollars). The U.K. study by Picot et al. (14) estimated an ICER of £1,634 ($2,428) per QALY for banding surgery in obese patients with early-onset type 2 diabetes over a 20-year period. Over a 2-year period (i.e., avoiding the need to extrapolate data beyond the follow-up period of the RCT), the ICER was estimated to be £20,159 ($29,954) per QALY. (In the study by Picot et al. [14], all costs were measured in 2010 U.K. pounds and have been converted to 2010 U.S. dollars using

| Intervention Description | Total lifetime QALYs | Probability that intervention is cost-effective at $30,000/QALY threshold = 100% | £1,634 ($2,428) per QALY gained* |
|---------------------------|---------------------|---------------------------------------------|---------------------------------|
| Laparoscopic adjustable gastric banding surgery (including surgery, consumables, inpatient stay, dietitian, therapy, reoperations) (20 years) | 11.49 (20 years) | *Resolution of type 2 diabetes in the intervention group (compared with nonintervention group) made the greatest contribution to the reduction in the ICER from £20,159 ($29,954) at 2 years (i.e., without extrapolation of RCT data) to £1,634 ($2,428) at 20 years (15).
yearly average currency exchange rates [www.irs.gov/Individuals/International-Taxpayers/Yearly-Average-Currency-Exchange-Rates; accessed 21 June 2016]. Although higher, because the cost savings arising from the resolution of type 2 diabetes in the surgical intervention group had yet to materialize, this was nonetheless still within the boundaries of cost-effectiveness thresholds (at least in the U.K.)(14).

**COSTS AND BENEFITS OF MEETING POTENTIAL DEMAND FOR BARIATRIC/METABOLIC SURGERY IN ENGLAND AND THE U.S.**

We used published data on the prevalence of obesity and type 2 diabetes (Tables 2 and 3) to estimate that 1.3 million adults with a BMI >30 kg/m² in England (19–24) and 10.1 million adults in the U.S. (25–30) are living with type 2 diabetes (of these, 590,000 adults in England and 5.5 million adults in the U.S. had a BMI >35 kg/m², as demonstrated in the model in Fig. 2). Incidence data were used to estimate that there are 120,000 additional cases of type 2 diabetes among people with a BMI >30 kg/m² each year in England, and 860,000 additional cases each year in the U.S. (of these, 54,000 people in England and 470,000 people in the U.S. had a BMI >35 kg/m²).

When compared with data on the annual number of patients with diabetes who are treated with metabolic surgery in England and the U.S. (1,500 people in England (Table 2) and 41,000 in the U.S. (Table 3)), only a small proportion of patients who might be eligible for surgery currently receive surgery. The number of patients with type 2 diabetes who are currently treated each year with bariatric surgery is equivalent to 1.2% of the estimated number of new cases of type 2 diabetes among people with a BMI >30 kg/m² in England or 4.8% in the U.S.

We estimated the potential costs and benefits of treating more obese patients with diabetes with bariatric/metabolic surgery using published data (Tables 2 and 3) on the costs and benefits of treatment. We considered both obese people with incident diabetes who are likely to become eligible for surgery each year, as well as potential existing case patients (i.e., people in the general population with type 2 diabetes and a BMI >30 or 35 kg/m² who have not previously accessed treatment).

During the Policy Lab, we presented a scenario in which 70% of people with type 2 diabetes and a BMI >30 kg/m² were considered by their doctors to be eligible for treatment, and 5% of them went on to choose surgery. Accordingly, we estimated that the current annual number of people with type 2 diabetes treated with bariatric/metabolic surgery would need to increase sixfold in England (to ~9,000 per annum), and by >60% in the U.S. (to ~65,000 per annum), if the potential demand for bariatric/metabolic surgery (from both new and existing cases of obese patients with diabetes) were to be addressed over a 10-year period (Table 4). In this scenario, the additional annual “upfront” cost of bariatric/metabolic surgery would be £35.8 million ($52.6 million) in England and $686 million in the U.S. (in 2015 prices). Thus, despite evidence of the cost-effectiveness of bariatric/metabolic surgery and the large costs already associated with treating diabetes (described above), these upfront costs may represent a challenge to limited health care budgets.

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**Table 2—Published estimates of the prevalence and incidence of type 2 diabetes and obesity, and cost and benefits of bariatric surgery (England)**

| Variable | Value | Source/justification |
|----------|-------|----------------------|
| Population prevalence and incidence | | |
| Prevalence of type 2 diabetes in adult population | 5.6% | 6.2% (doctor diagnosed, i.e., excluding undiagnosed, type 1 and type 2 diabetes) (20), of which 90% is type 2 diabetes (9) |
| Incidence of diabetes | 115,000/year | |
| Proportion of type 2 diabetics with BMI >35 | 23.6% | National Diabetes Audit 2012/13 (22) |
| Proportion of type 2 diabetics with BMI >30 | 28.9% | National Diabetes Audit 2012/13 (22) |

| Assumptions about appropriate use of bariatric surgery | | |
| Proportion suitable for surgery | 70% | Based on National Diabetes Audit 2012/13, which says 70% of obese patients with diabetes receive “usual care”/tier 3 intervention (22) |
| Proportion who choose surgery | 5% | Expert opinion |
| Age range of adults who are suitable for surgery | All ages over 18 years | Expert opinion |

| Published estimates of current use | | |
| Numbers treated | 6,170 | Estimates provided by the National Bariatric Surgery Registry based on 2012/13 Hospital Episode Statistics data (we assumed this referred only to England) (23); we multiplied data on 11 months (n = 5,656) by 12/11; another study (24) also provided a similar estimate |
| Proportion of those patients treated who have type 2 diabetes | 24% | (24) |

| Published estimates of costs and benefits of surgery | | |
| Upfront cost | £4,892 ($7,184) | Laparoscopic adjustable banding; adjusted for 2015 prices using £4,546 in 2010 (14); |
| Incremental costs | £1,928 ($2,831) | Laparoscopic adjustable banding 20-year incremental costs and QALYs for patients with type 2 diabetes (£1,792 in 2010) (GBP or other surgery not available); estimates are for BMI of >30 and <40 kg/m² |
Nevertheless, the cost-effectiveness estimates in the study by Picot et al. (14) suggest that, in the scenario where a policy of increased bariatric/metabolic surgery is sustained for a 10-year period, health gains would be in excess of 50,000 QALYs in England and 580,000 QALYs in the U.S. (with associated incremental costs, which account for cost savings arising from diabetes remission in treated patients of £93.7 million [$137.6 million] in England and $8.2 billion in the U.S. [in 2015 prices]). We altered the assumptions on which these estimates are based to provide a range of alternative scenarios (Table 4). For example, should the potential demand for bariatric/metabolic surgery (both new and existing cases of obese patients with diabetes) be addressed over a shorter period of time (1 or 5 years) or if >5% of the eligible population chose surgery, then the annual costs and capacity requirements would inevitably rise substantially further.

**BUILDING BLOCKS TOWARD POLICY CHANGE**

Policy change does not follow from the provision of research and evidence alone. Much work is often needed for evidence to reach decision-makers (31). The first step often involves identifying the relevant policy community for the intended policy and practice change, whether at the national or local decision-making level. In the case of diabetes care, the target may include national health policy, including clinical guidelines, but also local practice and patient advocacy groups. Decision-makers at all levels will need to consider how to find sufficient funding to implement change, to gain the support of key stakeholders, and, crucially, to balance expenditure on immediate treatment needs with investment in longer-term preventive strategies. Second, given that decisions are taken at different tiers, change requires carefully targeted interventions of appropriate scale. In our Policy Lab, we identified the following four building blocks for policy and practice change that may facilitate increased use of bariatric/metabolic surgery for the treatment of type 2 diabetes: 1) communicating the scale of the costs and harms associated with diabetes; 2) articulating the potential role of bariatric/metabolic surgery for certain population groups; 3) identifying the cost-effectiveness arguments that may support expanding the use of bariatric/metabolic surgery; and 4) changing both the available resources and processes for incorporating bariatric/metabolic surgery into the appropriate clinical pathways (Fig. 3). We discuss each in turn below.

**Communicating the Scale of the Global Diabetes Challenge**

Policy change requires policy-makers and practitioners to be motivated to act; this is contingent on evidence that changes in policy and practice will improve outcomes, reduce costs, and/or reduce harms. In the case of type 2 diabetes, there appears to be a growing awareness of the magnitude of the problem globally. However, participants at the Policy Lab noted that there is still a need to present a more detailed breakdown of the costs of diabetes, including better data on the prevalence of and costs of diabetes complications (e.g., retinopathy, renal disease, and neuropathy), and to improve awareness of the wider social and economic costs and harms associated with the disease.

**Articulating the Role of Bariatric/Metabolic Surgery for the Treatment of Diabetes**

Once the case for action has been made, the next stage involves articulating the

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**Table 3—Published estimates of the prevalence and incidence of type 2 diabetes and obesity, and cost and benefits of bariatric/metabolic surgery (U.S.)**

| Variable | Value | Source/justification |
|----------|-------|----------------------|
| Population prevalence and incidence | | |
| Prevalence of type 2 diabetes in adult population | 8.1% | National Health Interview Survey 2014: 9.0% (type 1 and type 2) (25), of which we assumed 90% is type 2 diabetes (9) |
| Incidence of diabetes | 690 /100,000/year | National Health Interview Survey 2014 (26) |
| Proportion of patients with type 2 diabetes with BMI >35 kg/m² | 27.7% | NHANES data (30) |
| Proportion of patients with type 2 diabetes with BMI >30 and >35 kg/m² | 23.2% | NHANES data (30) |
| Assumptions about appropriate use of bariatric surgery | | |
| Proportion suitable for surgery | 70% | Based on estimates for England described in Table 2 |
| Proportion who choose surgery | 5% | Expert opinion |
| Age range of adults who are suitable for surgery | All ages over 18 years | Expert opinion |
| Published estimates of current use | | |
| Numbers treated | 124,838 | 2008. Excludes outpatient procedures. (27) |
| Proportion of those patients treated who have type 2 diabetes | 33% | 1.2 (27) |
| Published estimates of costs and benefits of surgery | | |
| Upfront cost | $28,161 | Bypass surgery (includes all first-year costs), adjusted for 2015 prices using $23,871 in 2005 (15) |
| Incremental costs of treatment | $23,979 | Bypass surgery Adjusted for 2015 prices using $20,326 in 2005 (15) |
| Incremental QALYs | 1.70 | Figures relate to people with established type 2 diabetes and BMI ≥35 kg/m² (thus a conservative estimate of QALY gains compared with patients with newly diagnosed diabetes) |
specify the role that metabolic/bariatric surgery can play in the treatment of type 2 diabetes among certain population groups. The guidelines of the National Institute for Clinical Excellence (NICE) in England and Wales have already recommended that bariatric/metabolic surgery be considered for patients with a BMI of $\geq 30$ kg/m$^2$ with recent-onset (<10 years) type 2 diabetes. For patients with a BMI of $\geq 35$ kg/m$^2$, the level of recommendation is stronger, suggesting that these patients should be offered expedited assessment for bariatric/metabolic surgery (32). These guidelines reflect the interpretation by NICE of existing clinical evidence on the efficacy of bariatric/metabolic surgery versus nonsurgical interventions in the treatment of type 2 diabetes. In the U.S., third-party payors, such as the Centers for Medicare & Medicaid Services (33), will reimburse for specific cases of metabolic/bariatric surgery with requirements for copayment and prior medical intervention, and recent recommendations also advise considering surgery for individuals with a BMI of $\geq 30$ kg/m$^2$ (34).

The typical arguments against surgery generally focus on the advantages of investing in prevention over providing relatively costlier treatment, or using low-cost lifestyle therapeutic approaches (e.g., diet and physical activity) over the more invasive and (initially) expensive surgical approach. Although devoting more resources to preventive efforts and encouraging early and lasting healthy lifestyle changes is objectively the most logical way to tackle the epidemic of diabetes, it is similarly evident that prevention is no longer possible for individuals with already established disease and that, for some of them, lifestyle interventions may be relatively ineffective (35). It is this latter group that constitutes the gap between those who are candidates for bariatric/metabolic surgery and those who received it who were identified earlier. Articulating this distinction clearly will be important in making the case for surgery.

Identifying the Cost-effectiveness Arguments for Bariatric/Metabolic Surgery

The third building block involves furthering the understanding of the cost-effectiveness of bariatric/metabolic surgery versus other interventions. With pressures on public expenditure and competing budgetary priorities, value-for-money is highly salient in public policy. The Policy Lab participants considered the existing evidence on the cost-effectiveness of bariatric/metabolic surgery to be reasonably robust, with good evidence that the cost per QALY gained is at least comparable (and may be lower) for bariatric/metabolic surgery than for other approved interventions (14,15). However, it was recognized that the completion of longer-term studies would be beneficial in building a more holistic picture of the evolution of the costs of bariatric/metabolic surgery over time, including rates of initial diabetes remission and the risk of subsequent relapse, and the impact of surgery on existent diabetes complications.

Changing the Available Resources and Processes for Incorporating Bariatric/Metabolic Surgery

These first three building blocks relate to the interactions between the academic and policy communities—the research communities must marshal and articulate the evidence for decision-makers to catalyze policy change. However, structural and political barriers to change may remain, and identifying these may be an important step toward change. Policy
Lab participants identified the following three sets of such barriers: those related to resources, those regarding understanding, and those associated with processes.

The availability of resources may be particularly pertinent, despite recognition of the demonstrated cost-effectiveness of bariatric/metabolic surgery. Meeting the substantial upfront costs of greater use of the treatment was viewed as a significant barrier to expanding provision in an environment of tight health care budgets, particularly in the U.K. context. The potential for treatment to be concentrated in Centres of Excellence was seen as one way of controlling delivery costs, whereas participants also suggested that alternative sources of finance could be sought, including from the private sector, to overcome short-term resource constraints, although we have not sought evidence that supports these suggestions within the scope of this study. The idea that upfront costs are a barrier to use may reflect some misconceptions, identified by participants, about bariatric/metabolic surgery. Bariatric/metabolic surgery, it was argued, is still largely conceived as a weight-loss intervention and, as such, it may be perceived as an extremely expensive option when compared with other (low-cost) weight-reduction interventions (e.g., diet and lifestyle modifications). Furthermore, bariatric/metabolic surgery may be mistakenly considered solely as a means to prevent future obesity-related complications rather than as a therapy for established disease, which is the case when the surgery is used to treat diabetes. This misconception may be a significant barrier to policy changes as expediting access to what is perceived to be a costly, preventive intervention might not be felt as a priority at a time of tight health care budgets.

Increasing understanding both of the severity of the challenges associated with the rising prevalence of diabetes and the process of surgery and its outcomes among the clinical and patient communities was also seen by Policy Lab participants as important for increasing the use of bariatric/metabolic surgery. While current guidelines on obesity treatment already recommend bariatric/metabolic surgery for certain groups of patients with type 2 diabetes (26,36), it is likely that very few general practitioners...
(primary care physicians) are aware of this recommendation; as a result, most diabetes care providers may not refer eligible patients to undergo surgery. There may also be misconceptions among doctors about the risk of bariatric/metabolic surgery (37) and inadequate knowledge of the improved outcomes of modern, minimally invasive surgical techniques that have helped to reduce the incidence of surgical complications. Better coverage of these topics in medical education and training courses for all health care workers could help to rectify this. Improved understanding among health care workers is likely to filter down to patients with type 2 diabetes.

Finally, according to the participants, processes matter, including how services are commissioned, delivered and incentivized. Participants noted a common complaint related to the poor or patchy provision of specialist presurgery services and the lack of coordination between the preparation for bariatric/metabolic surgery, the surgery itself, and follow-up care. It was suggested that the creation of multidisciplinary teams could bring coherence to the system and prevent bottlenecks from emerging. Bariatric/metabolic surgery also does not appear to be integrated into the established clinical care pathway for type 2 diabetes in England; for example, although bariatric/metabolic surgery is a recommended option for treating diabetes in the clinical pathway for obesity treatment, there is no reference to bariatric/metabolic surgery in either the previous or recently updated NICE guidelines on the management of type 2 diabetes (38). Including bariatric/metabolic surgery in diabetes treatment algorithms may help to increase its visibility for relevant clinicians and to improve access to surgery for eligible patients who opt for this surgery. This was the aim of the 2nd Diabetes Surgery Summit (DSS-II), which was held in conjunction with the 3rd World Congress on Interventional Therapies for Type 2 Diabetes in September 2015 (report to be published in Diabetes Care).

REFRAMING THE CONCEPT OF BARIATRIC/METABOLIC SURGERY

The Policy Lab hosted at the 3rd World Congress on Interventional Therapies for Type 2 Diabetes provided evidence of agreement among stakeholders that bariatric/metabolic surgery is an appropriate and cost-effective approach to the treatment of type 2 diabetes in some groups of patients. Given the evidence and challenges, participants identified the following four building blocks to facilitate changes in policy and practice, and to adequately increase the appropriate use of bariatric/metabolic surgery for the treatment of diabetes:

1. Communicate scale of diabetes challenge
2. Articulate role for bariatric/metabolic surgery
3. Identify cost-effectiveness / savings
4. Explore resources / processes to support surgery access
5. Reframing ‘diabetes surgery’

This issue may be addressed by properly using terms such as “metabolic” or “diabetes” surgery when gastrointestinal operations are offered with the primary intent to treat fully developed type 2 diabetes. We also noted above the importance of including bariatric/metabolic surgery in clinical guidelines for diabetes care as opposed to just in guidelines for obesity treatment.

CONCLUSIONS

This article has provided new calculations on the proportion of potentially eligible obese patients with diabetes who currently receive metabolic/bariatric surgery in light of new guidelines that recommend considering surgery for patients with diabetes with a BMI >30 kg/m² (34). This updates previous estimates provided by the American Society for Metabolic and Bariatric Surgery (39). Although more research is needed to identify specific clinical scenarios for the prioritization of surgical treatment in patients with type 2 diabetes, the case appears to be strong enough to engage relevant policymakers and practitioners in a concerted discussion of how to extend the appropriate use of bariatric/metabolic surgery as part of the mix of approaches...
to address the growing burden of type 2 diabetes.

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