

Maternal Excess Weight

Current Knowledge and Future Directions



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Weight Times in Perinatal Health

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Global Health Epidemic

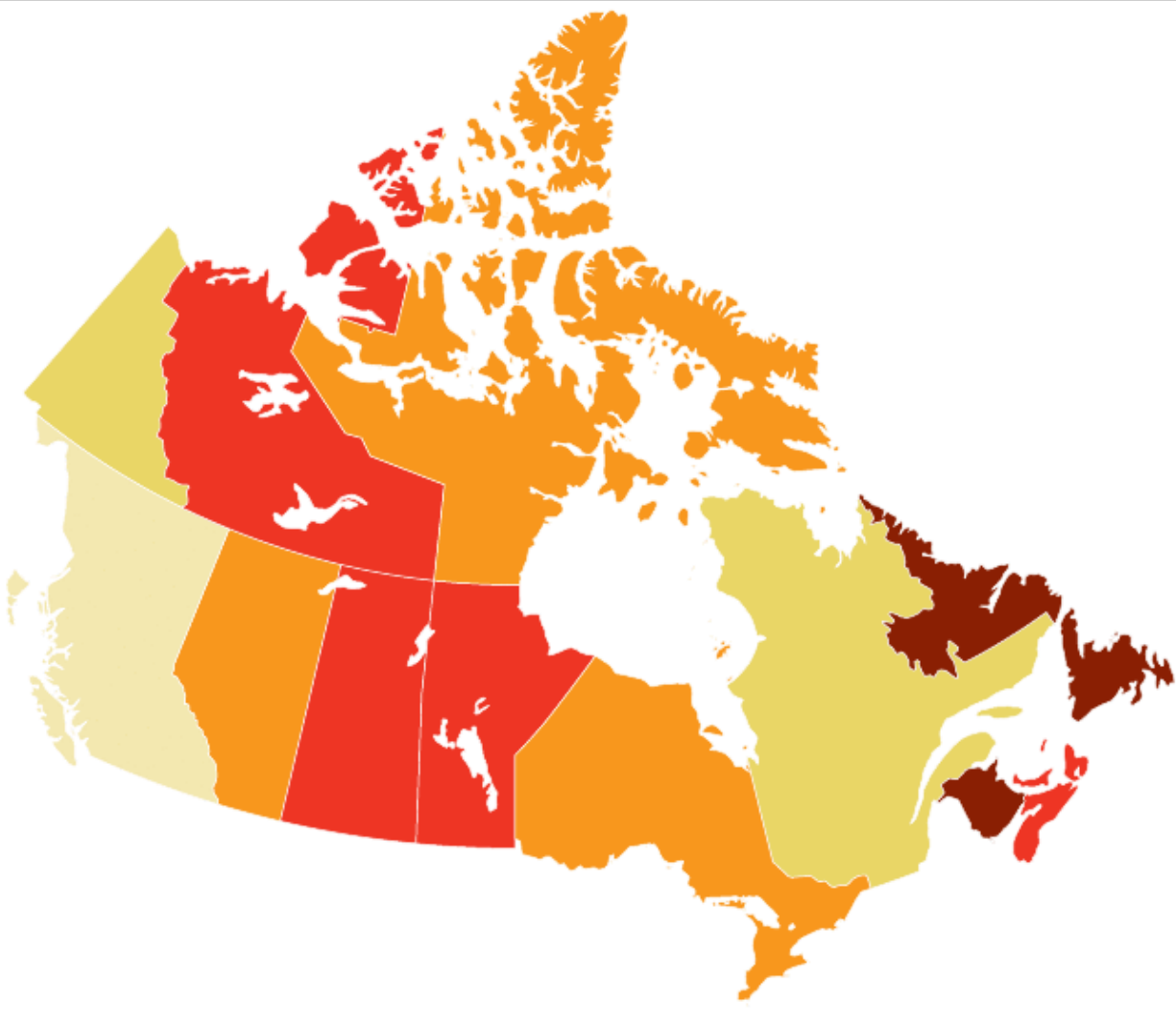
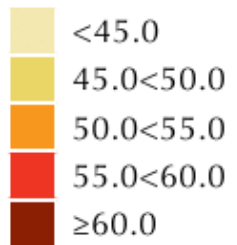
- 1 billion overweight or obese worldwide
 - 300 million obese
 - Major cause of mortality
- Obesity in Canada
 - Overweight: 8.6 million (36%)
 - Obese: 5.5 million (23%)
 - First Nations: 38% obese
 - Economic burden: \$7 billion per year

Branca F, WHO 2010

Statistics Canada Community Health Survey 2004

Age-standardized prevalence (%)

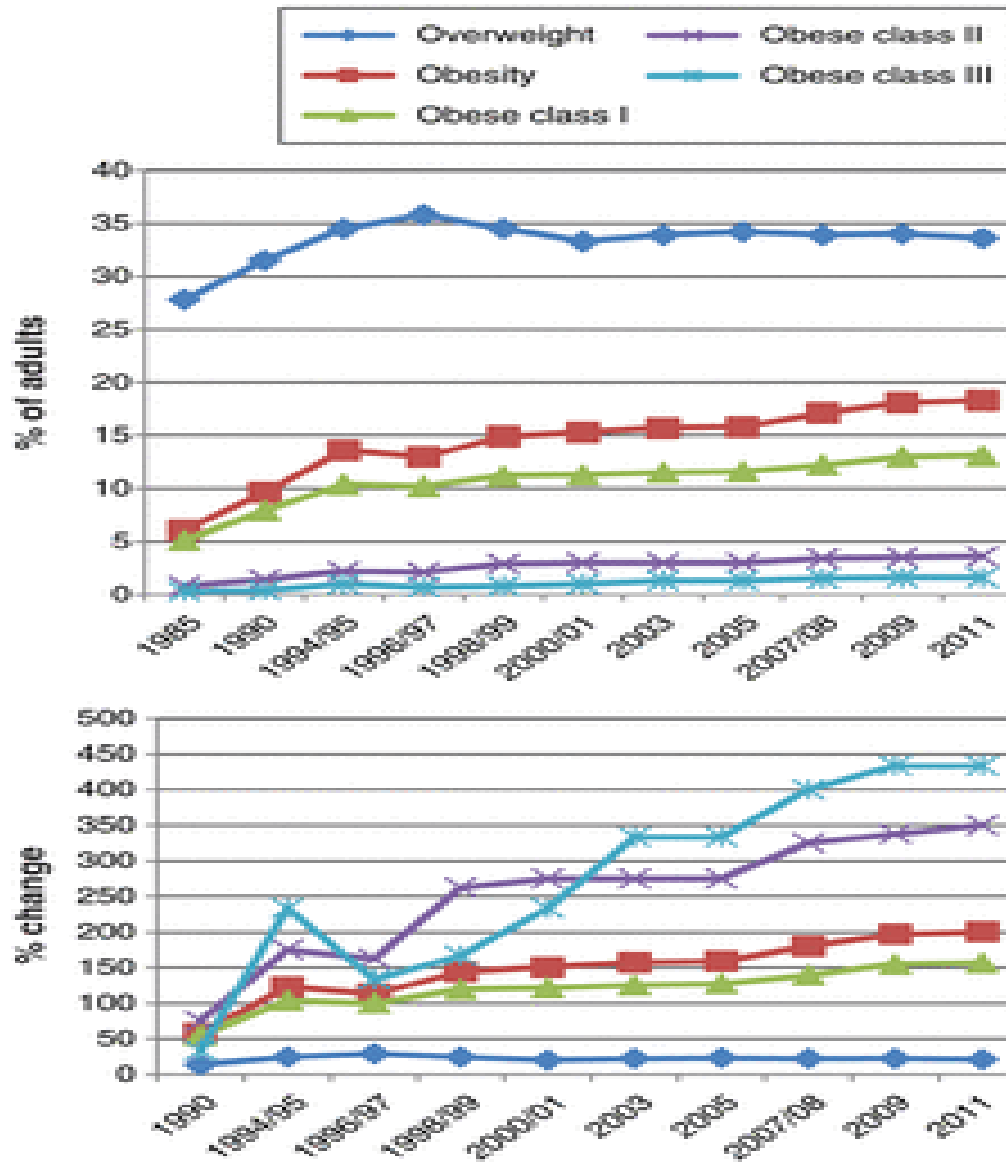
Newfoundland and Labrador	62.3
Prince Edward Island	55.7
Nova Scotia	57.9
New Brunswick	61.5
Quebec	48.0
Ontario	50.6
Manitoba	58.3
Saskatchewan	58.1
Alberta	52.9
British Columbia	42.9
Yukon	49.0
Northwest Territories	56.7
Nunavut	54.7



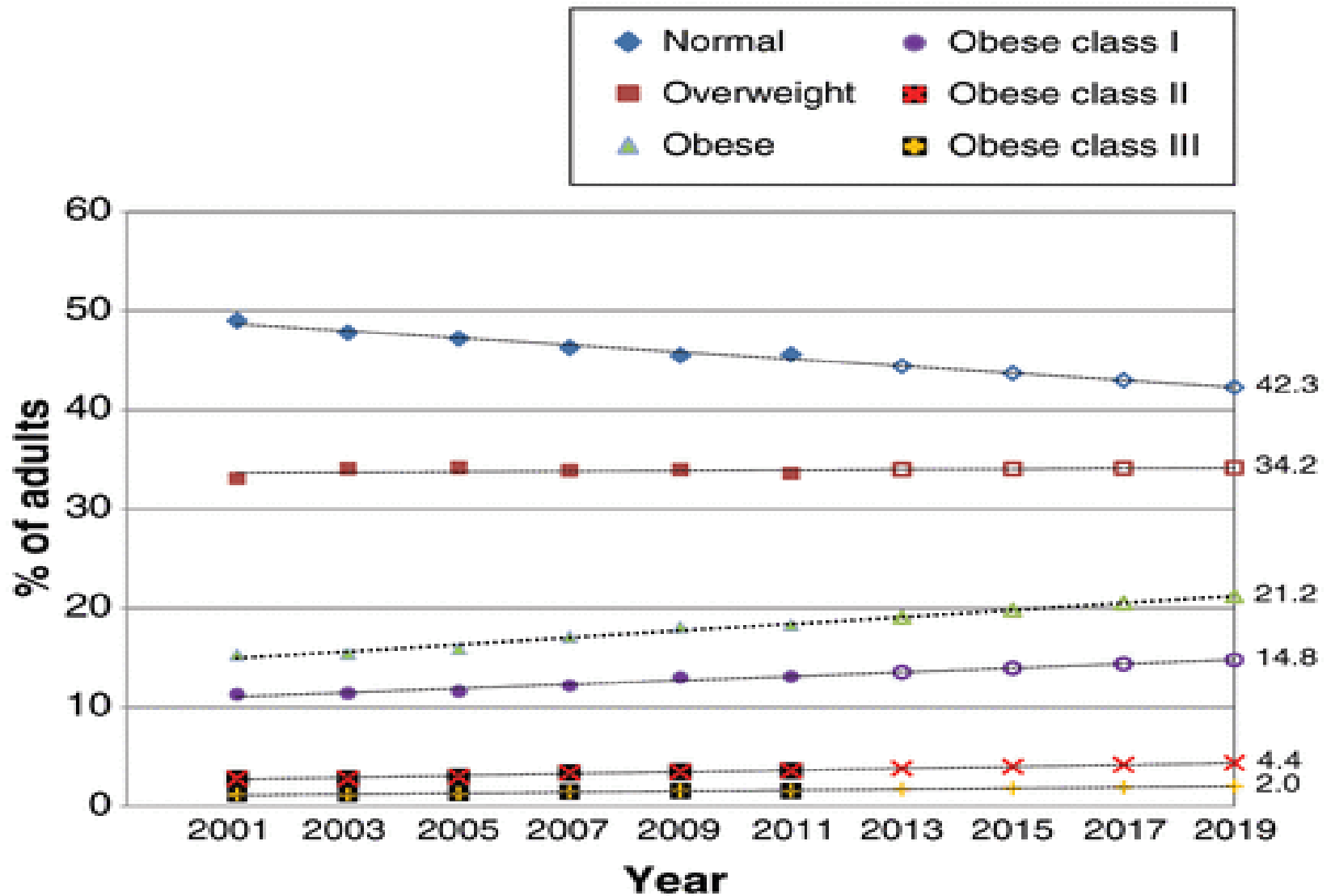
Prevalence by Obesity Category

Obesity Category	Canada	NS
Overweight (BMI 25-29.9)	33.6	37.5
Obese (BMI \geq 30)	18.3	23.7
Obese Class I (BMI 30-34.9)	13.1	15.6
Obese Class II (BMI 35-39.9)	3.6	5.8
Obese Class III (BMI \geq 40)	1.6	2.3
Overweight or obese (BMI \geq 25)	51.9	61.2

Adult Obesity Trends in Canada

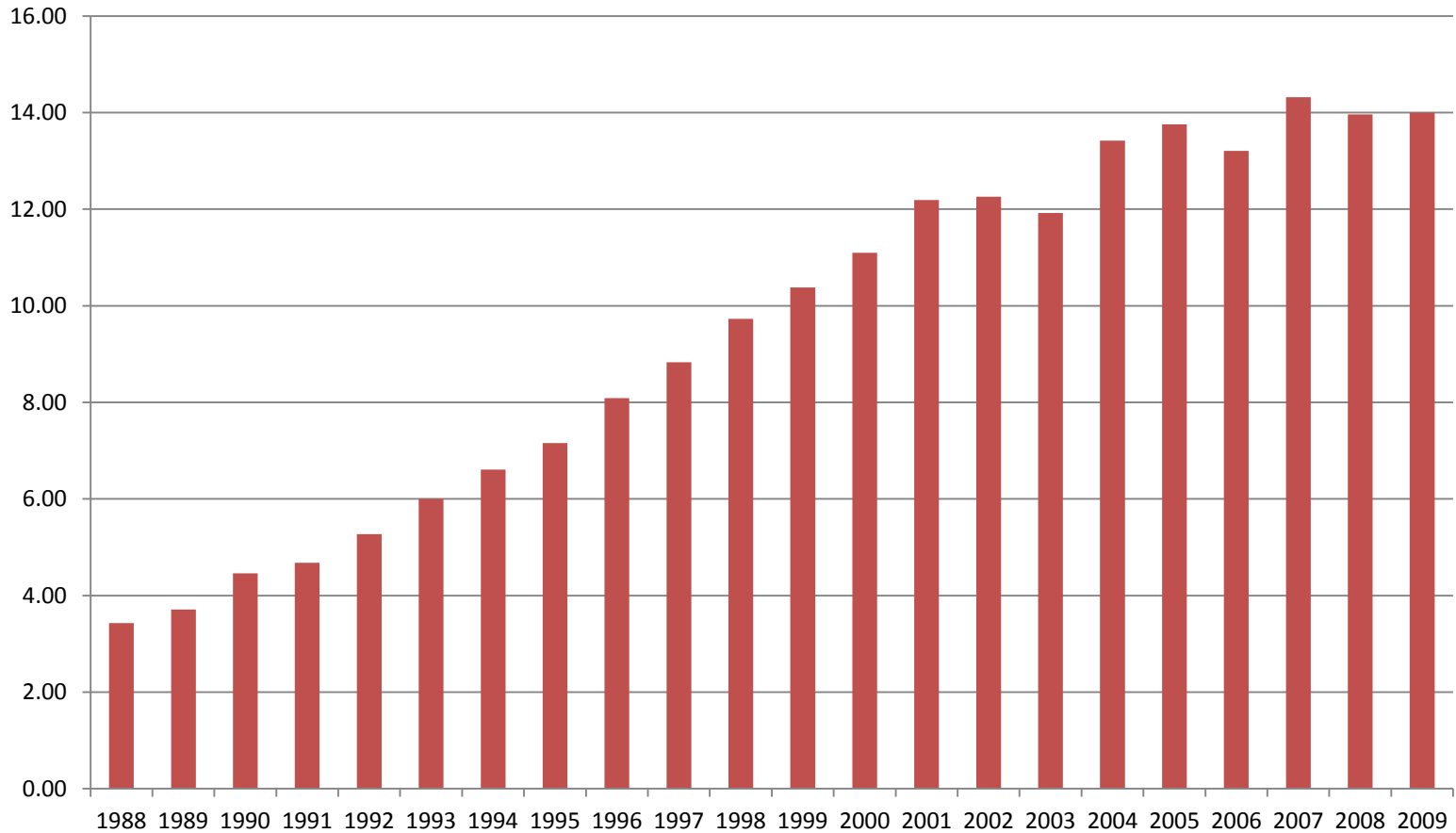


Future obesity prevalence in Canada



Women with Pre Pregnancy Weight >90kg in NS

% of women



Maternal and Newborn Consequences



Robinson HE, Obstet Gynecol 2005

Arendas K, J Obstet Gynecol Can 2008

Davies GA, J Obstet Gynecol Can 2010

Marshall NE, Semin Reprod Med 2012

Blomberg M, Obstet Gynecol 2013

Papachatzi E, J Neonat-Perinat Med, 2013

Effects on Fertility and Early Pregnancy

- Early reproductive dysfunction
 - Precocious menarche
 - Irregular menses
 - Oligo/amenorrhea
- Infertility
 - Ovulatory dysfunction
 - IVF/ICSI failure
- Spontaneous abortion

Antenatal Complications

- Gestational Diabetes (OR=2 - 8)
 - Increased insulin resistance
 - Inadequate insulin response
- Gestational HTN/Preeclampsia (OR = 2 – 7)
 - BMI increase of >3 between pregnancies increases risk 2-fold

Antenatal Complications

- Indicated Preterm Birth
- Dizygotic Twin pregnancy
- Thromboembolism (OR = 2 – 4.3)
- Obstructive sleep apnea

Antenatal Complications

- Infection
 - Urinary tract
 - Genital tract
 - Fever of unknown origin
 - Chorioamnionitis

Fetal Complications

Congenital anomalies

- Neural tube defects
- Cardiac malformations
- Oral/facial clefts
- Limb reduction anomalies

Fetal Complications

- Stillbirth/IUFD
 - OR = 1.5(overweight); 2(obese)
 - Unexplained; uteroplacental insufficiency
- Suboptimal fetal imaging
 - BMI 30-34 → 2.5 fold
 - BMI 35-39 → 5 fold
 - BMI >40 → 8 fold

Intrapartum Complications

- Dysfunctional labour
 - Prolonged active phase
 - Failure to progress
- Labour induction (OR=1.2 - 2.6)
 - Failed induction
- Increased failed VBAC rates
 - Normal weight – 15%
 - Overweight – 22%
 - Obese – 30%
 - Morbidly obese – 40%

Intrapartum Complications

- Shoulder Dystocia (OR = 1.5)
- Operative vaginal delivery
- Cesarean birth (OR=1.5 - 3)
 - Dysfunctional labour/Fetal distress
- Intraoperative complications
 - Increased OR time
 - Increased blood loss

Intrapartum Complications

- Perineal trauma
- Anesthesia (OR=1.3 – 2.2)
 - Multiple epidural attempts
 - Epidural failure
 - Hypotension \Rightarrow FHR bradycardia
 - Postdural puncture headache
 - Difficult intubation

Neonatal Complications

- Neonatal Death
- NICU admission
- Birth trauma
- Sepsis
- Respiratory distress
- Hypoglycemia

Postpartum Complications

- Maternal Death
 - 35% are in obese women
- Postpartum hemorrhage (OR=1.3 – 3)
- Wound infection/ Dehiscence (OR = 1.7/ 2)
- Breastfeeding Difficulties
 - Decreased lactogenesis
 - Decreased prolactin response to suckling
 - Breast morphology

Long Term Complications

- Type 2 Diabetes
 - 50% of obese women with GDM have Type 2DM within 15 years
- Metabolic syndrome
 - Obesity, hypertension
 - Insulin resistance, dyslipidemia
- Obesity in offspring

Management Strategies



SOGC Clinical Practice Guideline 2010

NICE Public Health Guideline 2010

ACOG Committee Opinion 2013

Pre-pregnancy Care

- Preconception weight reduction
 - Dietary and lifestyle interventions
 - Bariatric surgery
- Counsel regarding risks of obesity in pregnancy
- Prenatal vitamins and folic acid supplementation

Prenatal Care

- Calculate BMI and counsel on optimal weight gain during pregnancy
- Referral to dietician
- Early ultrasound to confirm viability and gestational age
- Dietary and lifestyle interventions
- Promote physical activity

Prenatal Care

- Maternal serum screening
- GDM screening in first trimester, if negative repeat at 24-28 weeks
- Detailed fetal anatomy ultrasound at 20 weeks
- Fetal movement surveillance
- Frequent blood pressure measurement

Optimal Weight Gain in Pregnancy

Pre-pregnancy weight (BMI)	Weight Gain	
	(kg)	(lbs)
Underweight (<20)	12.7 – 18.2	25 – 40
Normal (20-25)	11.4 – 15.9	25 – 35
Overweight (26-29)	8.8 – 11.4	15 – 25
Obese (>30)	6.8	15

Gestational Weight Gain Interventions

Weight loss during pregnancy in obese women

↓ macrosomia, preeclampsia, C-section

↓ maternal weight retention, childhood obesity

- concern regarding risk of SGA

Diet and lifestyle intervention RCTs

- inconsistent influence on pregnancy weight gain

- conflicting evidence of improved outcomes

No evidence-based guidelines on gestational weight management

Peripartum Care

- Anesthesia consult for BMI>40
- Anticipate need for induction
- Consider elective C-section for EFW>4500g for GDM, EFW>5000g for non-GDM
- Anticipate dysfunctional labour
- Anticipate failed VBAC

Peripartum Care

- Anticipate difficulty with external FHR monitoring
- Anticipate shoulder dystocia
- Active management of the third stage
- Subcutaneous sutures if adipose tissue greater than 2 cm
- Adequate personnel and material resources

Postpartum Care

- Early mobilization and thrombosis precautions
- Anticipate post-operative infections
- Lactation consultant
- Screen for Type 2 DM
- Counsel regarding risks of weight retention
- Encourage weight loss prior to next pregnancy

Opportunities for the Future

- Advocate for active healthy lifestyle choices by women and youth
- Call to action for NS governing bodies and society
- Education program for adolescents regarding the reproductive implications of obesity
- DHW education and lobbying roll for RCP using data from the NS Atlee Perinatal Database

Research Opportunities

- Determinants of maternal/child obesity and pregnancy outcomes
- Pre-pregnancy obesity weight reduction interventions
- Pregnancy weight management
- Prenatal programs for optimal interdisciplinary care and research
- Weight reduction after childbirth
- Breastfeeding and postpartum weight

Maternal Child Obesity Research Team



