



OBESITY IN PREGNANCY
PROTOCOL FOR CALCULATING THE BMI, FOR REFERRAL TO MORE SPECIALISED LEVELS OF CARE AND MANAGEMENT DURING THE ANTENATAL PERIOD

Introduction

The health risks of obese women are increased during pregnancy, labour and in the peripartum period. According to the UK confidential enquiries in to maternal deaths, 35% of all women who died were obese (50% more than the general population). The corresponding figure for South Africa is not known, as a Body Mass Index (BMI) is not routinely recorded on all antenatal cards. As MUAC does not give information on the challenge of obesity for obstetric and anaesthetic care, the PGWC recommendation is to calculate both BMI and MUAC at booking. As obesity is associated with increased maternal and neonatal morbidity, and therefore increased health costs, a routine BMI also helps in the planning of health service delivery.

Morbid obesity is associated with a 5-7 times higher incidence of hypertensive disorders in pregnancy and of gestational diabetes. There is a much higher incidence of Caesarean section and of perineal trauma. The main concern is with obstetric anesthesia, as all aspects of oxygenation and ventilation are affected.

The risks stratified according to BMI are shown below (from the RANZCOG guideline on obesity in pregnancy)

Variable	BMI < 18.5	BMI 18.5-25	BMI 25-30	BMI 30-35	BMI 35-40	BMI > 40
Hypertension in pregnancy	1%	2%	3%	5%	7%	10%
Gestational diabetes	1%	1%	2%	3%	6%	7%
Type 1 or 2 diabetes	0.2%	0.5%	0.3%	2%	3%	4%
Spontaneous vaginal birth	61%	55%	50%	47%	47%	44%
Assisted birth	13%	13%	10%	8%	6%	5%
Caesarean birth	26%	33%	40%	45%	47%	52%
Perinatal death	0.5%	0.7%	1%	1%	1.5%	2%
Neonatal Mechanical Ventilation	6%	5%	6%	7%	9%	10%
Preterm birth (<37 weeks)	9%	7%	8%	9%	10%	11%
Macrosomia	5%	11%	16%	19%	20%	21%
SGA (customised)	12%	11%	12%	13%	16%	19%
LGA (customised)	11%	11%	13%	13%	14%	16%

Definition

- The World Health Organization defines
 - Normal weight as a body mass index (BMI) of 18.5-24.9 kg/m²
 - Overweight (pre-obese) as a BMI of 25-29.9 kg/m²
 - Obesity as BMI > 30 kg/m²

- Class I obesity: BMI 30-34.9 kg/m²
- Class II obesity: BMI 35-39.9 kg/m²
- Class III obesity: BMI 40 and above (morbid obesity) kg/m²

Calculating the BMI

- BMI should be recorded on the antenatal card at the first visit using the pre-pregnancy weight (if available). Use the tables or a BMI calculator.
 - If a client books in the first trimester, use the first trimester weight to calculate the BMI.
 - If a client books in the second trimester, subtract 4kg from the weight and then calculate the BMI.
 - If a client books in the third trimester, subtract 8kg from the weight and then calculate the BMI.

Referral routes

- Patients with a booking BMI of < 35 kg/m² can be managed at a MOU or BANC+ clinic if otherwise low risk.
- Patients with a booking BMI of 35-39 kg/m² should ideally be managed at a district hospital if otherwise low risk.
- All patients with a booking BMI of 40 kg/m² or more should ideally be referred for specialist care to a regional hospital or specialist outreach clinic according to the BANC+ protocols.
- All patients with a booking BMI of > 50 kg/m² will need management and delivery at a tertiary institution. If the pregnancy is otherwise uncomplicated and managed at level 2, refer to a level 3 (sub-specialist) clinic/combined anaesthetic clinic at 36 weeks.

→ An anaesthetic referral should be done prior to induction of labour, elective caesarean section or vaginal delivery on any client with a body mass index of 45 kg/m² or more. Ideal gestation for this evaluation is around 36 weeks.

→ Make an appointment at a high risk clinic soon as possible after booking at the BANC+ clinic; ensure the patient is fasting on the morning of the appointment. Inform the patient that care will be shared between the BANC clinic/MOU and the specialist hospital, but that she must deliver at a specialist hospital.

Management at High Risk Clinic for BMI 40 kg/m² and more

1. First Visit at High Risk clinic

- Recalculate the BMI to ensure it was done correctly (re-measure and re-weigh the patient if BMI is close to 40 kg/m² to ensure accuracy)
- Do glucose profile to exclude pre-existing diabetes
- Do gestational scan (if not done already) to calculate gestational age
- Book for detail sonar at 20 weeks (L2 scan- Tygerberg Ultrasound tel 021 938 5572 for appointment) – if further pregnant: only arrange detail scan if not yet 23 weeks 6 days
- Do standard risk assessment
- Adjust level of care on antenatal card and mark off scheduled future HRC visits
- Refer to dietician (can be at local clinic if available)

- Identify women with chronic hypertension - they are at risk for more complications
- Do baseline creatinine and 24 urine protein in BMI complicated by diabetes, chronic hypertension or proteinuria on dipsticks If MUAC > 33cm- use obese cuff for BP measurement
- Give prophylactic iron and folate
- Request midstream urine sample for culture and sensitivity

2. Second visit at 20 weeks (High Risk Clinic)

- Check result of detail scan – correct EDD if needed
- Routine visit
- Plan next visit at 26 weeks
- Depression is a well-known key determinant of weight gain and obesity - screen for mental health

3. Third visit at 26 weeks (High Risk Clinic)

- Screen for GDM if first screening was negative
- Request UAD at FEC and check results – arrange follow up as indicated
- Evaluate maternal abdomen to determine if fetal growth can be monitored clinically (SF/clinical weight estimation) and indicate on gravidogram if a growth scan will be needed at 36 weeks (impossible to measure baby clinically)
- If all well, book next clinic visit at Tygerberg for 36 weeks and also book an anaesthetic clinic appointment for the same day. Write a referral for anaesthetics and leave it in the case record.
- Book 2-weekly visits from 30 weeks to 34 weeks at BANC/MOU clinic (shared care) if no other problems (no hypertension, no diabetes, normal UAD). Otherwise scheduled visits at Tygerberg.

4. Fourth visit at 30 weeks (MOU/Clinic)

- Blood pressure and urine dipsticks only (use obese blood pressure cuff)
- Not necessary to measure SF height

5. Fifth visit at 32 weeks (MOU/Clinic)

- Blood pressure and urine dipsticks only (use obese blood pressure cuff)
- Not necessary to measure SF height

6. Sixth visit at 34 weeks (MOU/Clinic)

- Blood pressure and urine dipsticks only (use obese blood pressure cuff)
- Not necessary to measure SF height

7. Seventh visit at 36 weeks (Tygerberg High Risk clinic)

- Do growth scan to evaluate fetal growth, if not possible to evaluate fetal size clinically

- Ensure patient is seen by the anaesthetist (if BMI \geq 45 kg/m²) before 12h00
- Remind woman that delivery is at Tygerberg and that she must arrange for transport in time when in labour.
- Do a glucose profile if not screened previously
- If good fetal growth, no anaesthetic concerns, no GDM, no hypertension, no complications and no elective delivery required, book follow up visits at 38 and 40 weeks at BANC/MOU and give a date for 41 week's visit at Tygerberg (if still undelivered).

8. Eighth visit at 38 weeks (BANC+/MOU)

- Blood pressure and urine dipsticks only (use obese blood pressure cuff)
- Not necessary to do SF

9. Ninth visit at 40 weeks (BANC+/MOU)

- Blood pressure and urine dipsticks only (use obese blood pressure cuff)
- Not necessary to do SF

10. Tenth visit at 41 weeks at Tygerberg (if still undelivered)

- Review delivery plan
- Do stretch-and-sweep of membranes
- Arrange for elective delivery before 42 weeks

Remember:

- IOL only for obstetric indications
- VBAC may be less successful - counsel appropriately
- At CS - suturing of subcutaneous fat if >2cm
- Give thromboprophylaxis for all women with BMI > 40 kg/m² up to 1 week after birth

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DATE EFFECTIVE	1 July 2018
REVIEW DATE	1 July 2020
EVIDENCE	Evidence basis for the above decision is available on request

GS Gebhardt

TYGERBERG HOSPITAL BODY MASS INDEX TABLE

Weight*	45	47	49	51	53	55	57	59	61	63	65	67	69	71	73	75	77	79	81	83	85	87	89	91
Height	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg
150 cm	20	21	22	23	24	24	25	26	27	28	29	30	31	32	32	33	34	35	36	37	38	39	40	40
152 cm	19	20	21	22	23	24	25	26	26	27	28	29	30	31	32	32	33	34	35	36	37	38	39	39
154 cm	19	20	21	22	22	23	24	25	26	27	27	28	29	30	31	32	32	33	34	35	36	37	38	38
156 cm	18	19	20	21	22	23	23	24	25	26	27	28	28	29	30	31	32	32	33	34	35	36	37	37
158 cm	18	19	20	20	21	22	23	24	24	25	26	27	28	28	29	30	31	32	32	33	34	35	36	36
160 cm	18	18	19	20	21	21	22	23	24	25	25	26	27	28	29	29	30	31	32	32	33	34	35	36
162 cm	17	18	19	19	20	21	22	22	23	24	25	26	26	27	28	29	29	30	31	32	32	33	34	35
164 cm	17	17	18	19	20	20	21	22	23	23	24	25	26	26	27	28	29	29	30	31	32	32	33	34
166 cm	16	17	18	19	19	20	21	21	22	23	24	24	25	26	26	27	28	29	29	30	31	32	32	33
168 cm	16	17	17	18	19	19	20	21	22	22	23	24	24	25	26	27	27	28	29	29	30	31	32	32
170 cm	16	16	17	18	18	19	20	20	21	22	22	23	24	25	25	26	27	27	28	29	29	30	31	31
172 cm	15	16	17	17	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27	28	29	29	30	31
174 cm	15	16	16	17	18	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27	28	29	29	30
176 cm	15	15	16	16	17	18	18	19	20	20	21	22	22	23	24	24	25	26	26	27	27	28	29	29
178 cm	14	15	15	16	17	17	18	19	19	20	21	21	22	22	23	24	24	25	26	26	27	27	28	29
180 cm	14	15	15	16	16	17	18	18	19	19	20	21	21	22	23	23	24	24	25	26	26	27	27	28
182 cm	14	14	15	15	16	17	17	18	18	19	20	20	21	21	22	23	23	24	24	25	26	26	27	27
184 cm	13	14	14	15	16	16	17	17	18	19	19	20	20	21	22	22	23	23	24	25	25	26	26	27
186 cm	13	14	14	15	15	16	16	17	18	18	19	19	20	21	21	22	22	23	23	24	25	25	26	27
188 cm	13	13	14	14	15	16	16	17	18	18	19	19	20	20	21	21	22	22	23	23	24	25	26	26
190 cm	12	13	14	14	15	15	16	16	17	17	18	19	19	20	21	21	22	22	23	23	24	25	26	26

Refer for nutritional supplementation. At risk for poor fetal growth.

Increased risk for pre-eclampsia and diabetes. Antenatal care and delivery in district hospital where feasible

Screen for diabetes at booking and 26 weeks. Increased risk for diabetes and hypertensive complications. Management at regional hospital where feasible.

*Weight is based on pre-pregnancy or first trimester weight. If calculation is only done in the 2nd semester, first subtract 4kg from the weight and then calculate the BMI. In the third trimester, subtract 8kg from weight and then calculate the BMI.

TYGERBERG HOSPITAL BODY MASS INDEX TABLE

Weight*	93 kg	95 kg	97 kg	99 kg	101 kg	103 kg	105 kg	107 kg	109 kg	111 kg	113 kg	115 kg	117 kg	119 kg	121 kg	123 kg	125 kg	127 kg	129 kg	131 kg	133 kg	135 kg	137 kg	139 kg
150 cm	41	42	43	44	45	46	47	48	48	49	50	51	52	53	54	55	56	56	57	58	59	60	61	62
152 cm	40	41	42	43	44	45	45	46	47	48	49	50	51	52	52	53	54	55	56	57	58	58	59	60
154 cm	39	40	41	42	43	43	44	45	46	47	48	48	49	50	51	52	53	54	54	55	56	57	58	59
156 cm	38	39	40	41	42	42	43	44	45	46	46	47	48	49	50	51	51	52	53	54	55	55	56	57
158 cm	37	38	39	40	40	41	42	43	44	44	45	46	47	48	48	49	50	51	52	52	53	54	55	56
160 cm	36	37	38	39	39	40	41	42	43	43	44	45	46	46	47	48	49	50	50	51	52	53	54	54
162 cm	35	36	37	38	38	39	40	41	42	42	43	44	45	45	46	47	48	48	49	50	51	51	52	53
164 cm	35	35	36	37	38	38	39	40	41	41	42	43	44	44	45	46	46	47	48	49	49	50	51	52
166 cm	34	34	35	36	37	37	38	39	40	40	41	42	42	43	44	45	45	46	47	48	48	49	50	50
168 cm	33	34	34	35	36	36	37	38	39	39	40	41	41	42	43	44	44	45	46	46	47	48	49	49
170 cm	32	33	34	34	35	36	36	37	38	38	39	40	40	41	42	43	43	44	45	45	46	47	47	48
172 cm	31	32	33	33	34	35	35	36	37	38	38	39	40	40	41	42	42	43	44	44	45	46	46	47
174 cm	31	31	32	33	33	34	35	35	36	37	37	38	39	39	40	41	41	42	43	43	44	45	45	46
176 cm	30	31	31	32	33	33	34	35	35	36	36	37	38	38	39	40	40	41	42	42	43	44	44	45
178 cm	29	30	31	31	32	33	33	34	34	35	36	36	37	38	38	39	39	40	41	41	42	43	43	44
180 cm	29	29	30	31	31	32	32	33	34	34	35	35	36	37	37	38	39	39	40	40	41	42	42	43
182 cm	28	29	29	30	30	31	32	32	33	34	34	35	35	36	37	37	38	38	39	40	40	41	41	42
184 cm	27	28	29	29	30	30	31	32	32	33	33	34	35	35	36	36	37	38	38	39	39	40	40	41
186 cm	27	27	28	29	29	30	30	31	32	32	33	33	34	34	35	36	36	37	37	38	38	39	40	40
188 cm	26	27	27	28	29	29	30	30	31	31	32	33	33	34	34	35	35	36	36	37	38	38	39	39
190 cm	26	26	27	27	28	29	29	30	30	31	31	32	32	33	34	34	35	35	36	36	37	37	38	39



At risk for pre-eclampsia and diabetes. Antenatal care and delivery in district hospital where feasible

Screen for diabetes at booking and 26 weeks. At high risk for diabetes and hypertensive complications. Management at regional hospital where feasible.

Screen for diabetes at booking and 26 weeks. Increased risk for diabetes and hypertensive complications. Management at tertiary hospital where feasible. Increased risk for complications during delivery (e.g. shoulder impaction) and anaesthetics (e.g. difficult airway, postoperative difficulty with breathing etc).

*Weight is based on pre-pregnancy or first trimester weight. If calculation is only done in the 2nd semester, first subtract 4kg from the weight and then calculate the BMI. In the third trimester, subtract 8kg from weight and then calculate the BMI.

TYGERBERG HOSPITAL
INTERDEPARTMENTAL REFERRAL FORM

Date of referral: _____

HIGH RISK CLINIC C3B

Name:

Folder Number:.....

Date of Birth:

From:

Doctor:

Ext: Bleeper:

To:

Doctor: J Burke / anaesthetist in charge

Department: Anaesthetics

Referral for evaluation of High Risk Pregnancy

Dear colleague

Please evaluate this person for anaesthetic risks related to labour and delivery.

She is currently _____ weeks pregnant, gravida _____ and parity _____

She has the following risk factors: BMI >45 kg/m²

*Pulmonary disease (specify _____)

**Cardiac disease (specify _____)

Other: _____

Results of special investigations:

Glucose profile: Fasting _____ mmol/l Postprandial _____ mmol/l on (date:)

*Lung functions attached Blood pressure _____ mm/Hg

**Cardiac echo attached Heart rate _____ bpm Resp rate _____

Pending results:

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SIGNED:



TYGERBERG HOSPITAL

REPLY TO REFERRAL

INTERPRETATION OF PROBLEM

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Management (diagnostic, therapeutic and counseling)

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Inpatient		Transfer when:	Ward:
	
Outpatient		Clinic:	Date:
	

SIGNED:

