Oxford Centre for Clinical Magnetic Resonance Research (OCMR)		
Dobutamine use in stress CMR		
WORK INSTRUCTION 03	Revision: First Issue (version 2.0)	Date: 01/09/2017
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1.0 PURPOSE

The purpose of this document is to provide instruction for use of dobutamine in stress cardiac MR imaging at OCMR.

2.0 SCOPE

This work instruction should be referred to when using dobutamine for stress cardiac MR imaging (ensuring compliance with SOP OCMR_004 Minimum Attendance Policy).

3.0 RECORDS

Records of the batch number, expiry date and person administering should be recorded on the appropriate study record sheet.

4.0 ASSOCIATED DOCUMENTS

This document should be read in conjunction with SOP OCMR_001 MR Scanning and SOP OCMR_004 Minimum Attendance Policy (available on the OCMR website).

5.0 RESPONSIBILITY

This work instruction is maintained and reviewed by the OCMR SOP committee.

6.0 INSTRUCTIONS

6.1 Pre- infusion checklist

- The minimum attendance policy for stress scanning must be adhered to.
- Exclude contraindications:
  - Severe outflow obstruction (aortic stenosis, HCM)
  - Acute Coronary Syndrome

- Left ventricular failure with symptoms at rest
- Recent history of arrhythmias
- Severe hypertension (>220/120)
- Recent pulmonary embolus / infarction
- Thrombophlebitis / active DVT
- Known hypokalaemia
- Active endocarditis, myocarditis, pericarditis
- No ECG contraindications

6.2 Check resting blood pressure and pulse, ensure good ECG tracing, record pulse rate.

6.3 Draw up 50mls of dobutamine (5mg/ml) from the vial into a 60ml syringe and label clearly.

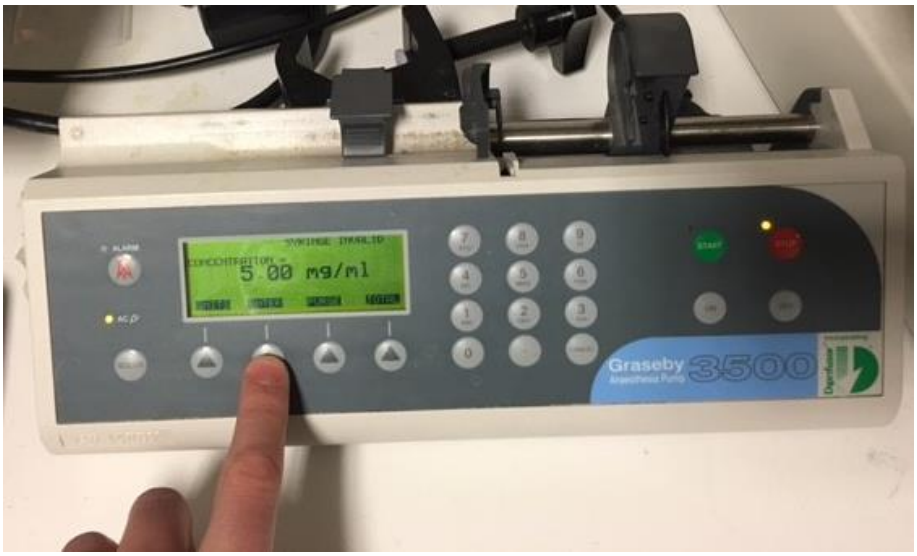
6.4 Ensure a reversal agent is easily accessible (a short acting beta-blocker, Esmolol or Metoprolol).

6.5 Connect the filled syringe to three 200cm extension lines (needed to reach the magnet bore) and expel all air within the tubing (manually or with the purge setting on the Graseby pump). Place the syringe in the Graseby pump and ensure the latch is

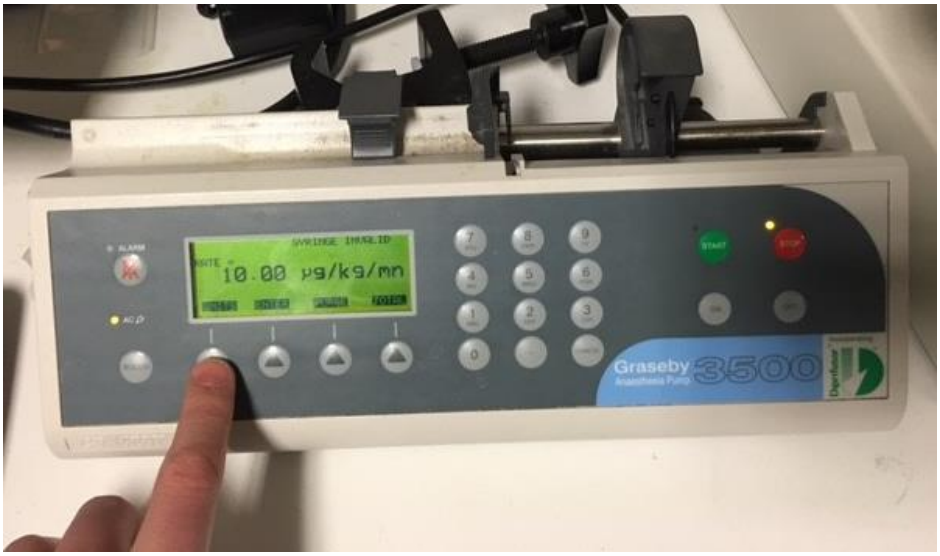
closed.

6.6 Ensure the settings are as follows:

6.6.1 **Concentration:** 5mg/ml



6.6.2 **Rate:** Start at 5-10 µg/kg/min increased in increments of up to 10 to a max of 40 µg/kg/min at 3 minute intervals.



6.6.3 **Weight:** Enter the weight of the patient in kg (an example of 100kg is shown here).

6.6.4 After enter is pressed the “End of Menu” screen appears. Press the green start

button to begin the infusion.

6.7 Calculate the target heart rate according to the chart below

% Max Target Heart Rate (BPM)

Age	65%	85%	100%	Age	65%	85%	100%
18	131	172	202	**52**	109	143	168
19	131	171	201	**53**	109	142	167
20	130	170	200	**54**	108	141	166
21	129	169	199	**55**	107	140	165
22	129	168	198	**56**	107	139	164
23	128	167	197	**57**	106	139	163
24	127	167	196	**58**	105	138	162
25	127	166	195	**59**	105	137	161
26	126	165	194	**60**	104	136	160
27	125	164	193	**61**	103	135	159
28	125	163	192	**62**	103	134	158
29	124	162	191	**63**	102	133	157
30	124	162	190	**64**	101	133	156
31	123	161	189	**65**	101	132	155
32	122	160	188	**66**	100	131	154
33	122	159	187	**67**	99	130	153
34	121	158	186	**68**	99	129	152
35	120	157	185	**69**	98	128	151
36	120	156	184	**70**	98	128	150
37	119	156	183	**71**	97	127	149
38	118	155	182	**72**	96	126	148
39	118	154	181	**73**	96	125	147
40	117	153	180	**74**	95	124	146
41	116	152	179	**75**	94	123	145
42	116	151	178	**76**	94	122	144
43	115	150	177	**77**	93	122	143
44	114	150	176	**78**	92	121	142
45	114	149	175	**79**	92	120	141
46	113	148	174	**80**	91	119	140
47	112	147	173	**81**	90	118	139
48	112	146	172	**82**	90	117	138
49	111	145	171	**83**	89	116	137
50	111	145	170	**84**	88	116	136
51	110	144	169	**85**	88	115	135

6.8 Ensure careful cannulation to prevent extravasation.

6.9 Double check the starting infusion rate displayed on the screen according to the weight table below:

Infusion Rate (ml) According to ug/kg/min dose

	ug/kg/min					ug/kg/min			
	10	20	30	40		10	20	30	40
Weight	Rate ml/hr				Weight	Rate ml/hr			
40	4.8	9.6	14.4	19.2	108	13.0	25.9	38.9	51.8
42	5.0	10.1	15.1	20.2	110	13.2	26.4	39.6	52.8
44	5.3	10.6	15.8	21.1	112	13.4	26.9	40.3	53.8
46	5.5	11.0	16.6	22.1	114	13.7	27.4	41.0	54.7
48	5.8	11.5	17.3	23.0	116	13.9	27.8	41.8	55.7
50	6.0	12.0	18.0	24.0	118	14.2	28.3	42.5	56.6
52	6.2	12.5	18.7	25.0	120	14.4	28.8	43.2	57.6
54	6.5	13.0	19.4	25.9	122	14.6	29.3	43.9	58.6
56	6.7	13.4	20.2	26.9	124	14.9	29.8	44.6	59.5
58	7.0	13.9	20.9	27.8	126	15.1	30.2	45.4	60.5
60	7.2	14.4	21.6	28.8	128	15.4	30.7	46.1	61.4
62	7.4	14.9	22.3	29.8	130	15.6	31.2	46.8	62.4
64	7.7	15.4	23.0	30.7	132	15.8	31.7	47.5	63.4
66	7.9	15.8	23.8	31.7	134	16.1	32.2	48.2	64.3
68	8.2	16.3	24.5	32.6	136	16.3	32.6	49.0	65.3
70	8.4	16.8	25.2	33.6	138	16.6	33.1	49.7	66.2
72	8.6	17.3	25.9	34.6	140	16.8	33.6	50.4	67.2
74	8.9	17.8	26.6	35.5	142	17.0	34.1	51.1	68.2
76	9.1	18.2	27.4	36.5	144	17.3	34.6	51.8	69.1
78	9.4	18.7	28.1	37.4	146	17.5	35.0	52.6	70.1
80	9.6	19.2	28.8	38.4	148	17.8	35.5	53.3	71.0
82	9.8	19.7	29.5	39.4	150	18.0	36.0	54.0	72.0
84	10.1	20.2	30.2	40.3	152	18.2	36.5	54.7	73.0
86	10.3	20.6	31.0	41.3	154	18.5	37.0	55.4	73.9
88	10.6	21.1	31.7	42.2	156	18.7	37.4	56.2	74.9
90	10.8	21.6	32.4	43.2	158	19.0	37.9	56.9	75.8
92	11.0	22.1	33.1	44.2	160	19.2	38.4	57.6	76.8
94	11.3	22.6	33.8	45.1	162	19.4	38.9	58.3	77.8
96	11.5	23.0	34.6	46.1	164	19.7	39.4	59.0	78.7
98	11.8	23.5	35.3	47.0	166	19.9	39.8	59.8	79.7
100	12.0	24.0	36.0	48.0	168	20.2	40.3	60.5	80.6
102	12.2	24.5	36.7	49.0	170	20.4	40.8	61.2	81.6
104	12.5	25.0	37.4	49.9	172	20.6	41.3	61.9	82.6
106	12.7	25.4	38.2	50.9	174	20.9	41.8	62.6	83.5

6.10 **During infusion**

6.10.1 Titrate dose up every 3 minutes based on response in increments of 5 – 10 µg/kg/min.

6.10.2 Once the target heart rate is reached perform the experimental protocol.

6.10.3 There must be continuous monitoring of BP (cycling 3 minutes), pulse rate (via ECG leads) and ECG morphology.

6.11 **Termination Criteria**

- Blood pressure drops >20mmHg below baseline (and symptomatic)
- Blood pressure increases >240/120
- Intractable symptoms
- Complex arrhythmias
- New or worsening wall motion/ thickening abnormalities in at least 2 adjacent segments
- New or worsening wall motion/ thickening associated with LV dilation
- Development of global reduction in systolic function

6.12 **For Reversal of Dobutamine**

6.12.1 **STOP** infusion (press STOP button)

6.12.2 Give either:

- Esmolol 0.5 mg/kg bolus IV +/- 0.2 mg/kg PRN

OR

- Metoprolol 1mg IV every minute (max 15mg)

6.13 **Possible Side Effects**

- Palpitations, ectopic heart beats, rarely VT, precipitates angina
- Increased systolic BP (10-20 mmHg)
- Nausea, vomiting, headaches, tingling, dyspnea
- Extravasation may cause dermal necrosis