

## Maternity - Decreased Fetal Movements in the Third Trimester

**Summary** Local Health Districts are required to have guidelines regarding the management of women who report decreased fetal movements in the third trimester of pregnancy.

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**Audience** All maternity clinicians;obstetricians;GPs;midwives;nursing;VMOs

## **MATERNITY - DECREASED FETAL MOVEMENTS IN THE THIRD TRIMESTER**

### **PURPOSE**

These guidelines provide direction to NSW maternity services regarding the management of pregnant women who report decreased fetal movements (DFM) in the third trimester of pregnancy.

### **KEY PRINCIPLES**

Analysis of adverse perinatal events in NSW has identified considerable variations in both clinical practice and information provided to women regarding DFM. This guidance is provided to improve consistency in the management of women with DFM through defining DFM and maternal perception of fetal activity, clarifying the role of formal fetal movement counting, standardising the investigation of DFM, and the management of ongoing maternal concern regarding DFM.

### **USE OF THE GUIDELINE**

Maternity services should use the information in these guidelines as practical guidance to manage pregnant women who report decreased fetal movements.

### **REVISION HISTORY**

<b>Version</b>	<b>Approved by</b>	<b>Amendment notes</b>
October 2011 (GL2011_012)	Deputy Director-General Population Health	New Guideline

### **ATTACHMENTS**

1. Maternity - Decreased Fetal Movements in the Third Trimester - Guideline

## Maternity - Decreased Fetal Movements in the Third Trimester



**Issue date:** October 2011

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## **1 BACKGROUND**

### **1.1 Purpose**

These guidelines provide direction to NSW maternity services regarding the management of pregnant women who report decreased fetal movements (DFM).

### **1.2 Background**

The overall perinatal mortality rate (PMR) in NSW over the past two decades has fallen slightly from around 10 to approximately 9 perinatal deaths per 1000 live births. This modest improvement is attributed to the advances in neonatal care over this time. Fetal death (stillbirth) rates, however, have failed to show any reduction. The PMR for Aboriginal and Torres Strait Islander babies remains substantially higher than that for babies of non-Aboriginal or Torres Strait Islander mothers. Analysis of PMR by country of maternal birth also reveals differences with the PMR highest among babies of mothers born in Middle Eastern and African countries.<sup>1</sup>

In 2007, one in four perinatal deaths was an unexplained antepartum death (stillbirth). Of the 204 unexplained stillbirths 60.3% were <2500 grams and 63.7% were <37 weeks gestation. The majority of these unexplained deaths occurred in otherwise normal pregnancies.<sup>1</sup>

Maternal perception of DFM is a common cause of unplanned antenatal presentation in the third trimester.<sup>2</sup> Maternal perception of DFM is associated with increased incidence of a number of adverse pregnancy outcomes including stillbirth, preterm delivery and intrauterine growth restriction.<sup>3</sup> Recent evidence suggests that the improved management of DFM and uniform information to women may be associated with fewer stillbirths.<sup>4</sup>

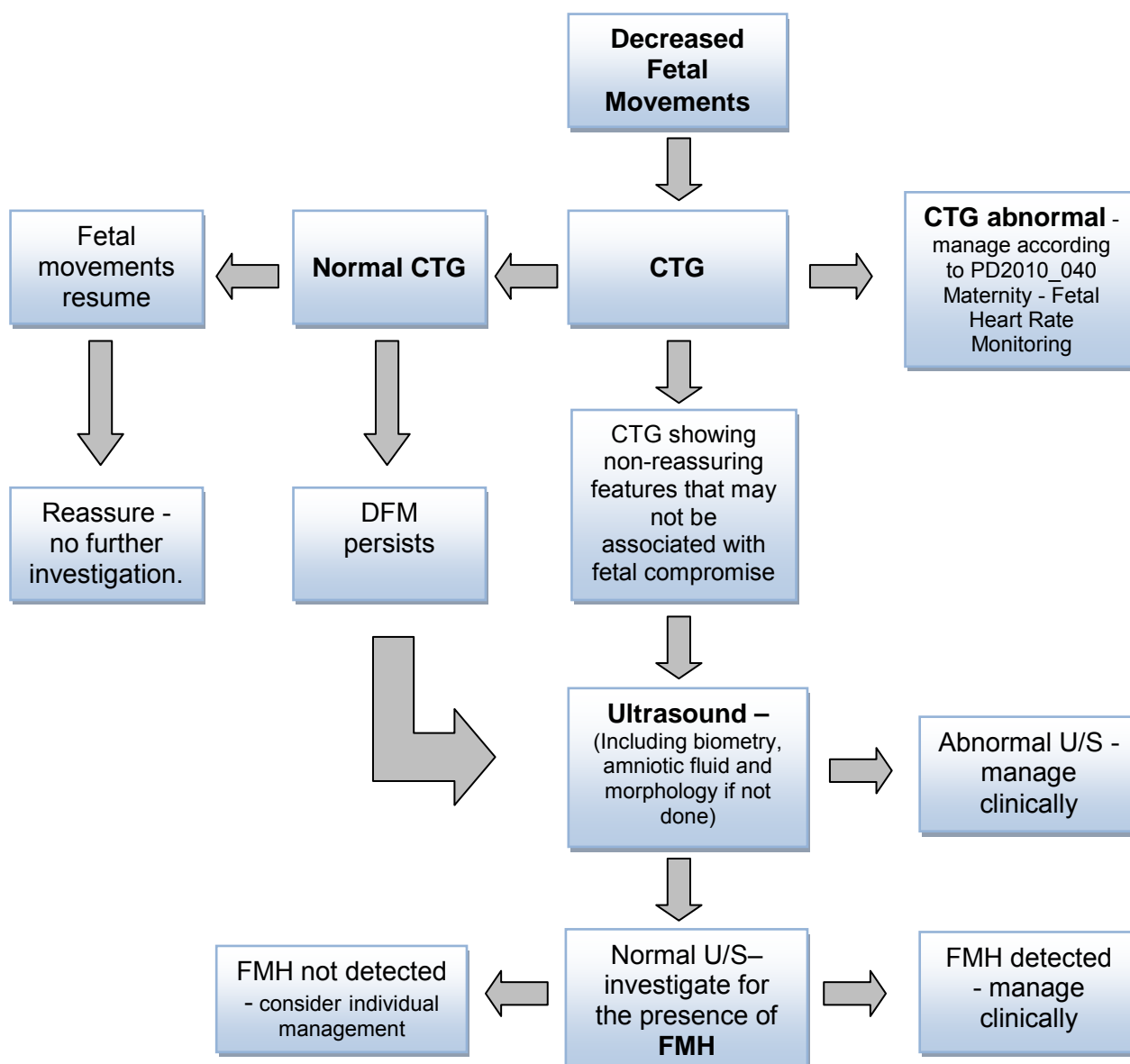
### **1.3 About this document**

In response to this issue, the Australian and New Zealand Stillbirth Alliance (ANZSA) has developed its Clinical Practice Guideline for the Management of Women who Report Decreased Fetal Movements in July 2010.<sup>5</sup> The document has been endorsed by the numerous bodies and in NSW has been endorsed by the Maternal & Perinatal Committee and the Maternal & Perinatal Health Priority Taskforce. The document forms the basis of this guidance. Table 1 summarises the key strategies with respect to the management of pregnant women who present with DFM in the third trimester of pregnancy. The following flow-chart (figure 1) illustrates the recommended investigation of women who present with DFM in the third trimester of pregnancy. Based on the above guideline more detailed information on each of these strategies can be found in the accompanying text.

**Table 1 - Summary of strategies for the management of pregnant women who present with decreased fetal movements in the third trimester of pregnancy <sup>5</sup>**

Strategy	Components
<b>Antenatal education – section 2.1</b>	<ul style="list-style-type: none"> <li>All pregnant women should be routinely provided with verbal and written information regarding normal fetal movements during the antenatal period.</li> <li>Such information should include a description of the changing pattern of movement as the fetus develops, normal sleep/wake cycles, and factors which may modify the mother's perception of movements such as maternal weight and placental position.</li> <li>All pregnant women should be advised to contact their maternity care provider if they have any concern about decreased or absent fetal movements and be advised not to wait until the next day to report DFM.</li> <li>After discussion, women who remain unsure whether movements are decreased or not should be given guidance on counting movements i.e. to count while lying down on her side and concentrating on fetal movements. As a rule, when the fetus is awake, if there are less than 10 movements felt in 2 hours she should contact her health care provider.</li> </ul> <p><b>NB - Maternal concern of DFM overrides any definition based on numbers of fetal movements and women with a concern about DFM should be encouraged to contact their maternity care provider.</b></p>
<b>Antenatal care – section 2.2</b>	<ul style="list-style-type: none"> <li>Clinicians should emphasise the importance of maternal awareness of fetal movements at every routine antenatal visit. <b>(NB - The use of kick-charts is not currently recommended as part of routine antenatal care.)</b></li> </ul>
<b>Clinical assessment – section 2.3</b>	<ul style="list-style-type: none"> <li>When a woman presents with DFM, assessment of the woman and her fetus should be undertaken as soon as possible.</li> <li>Such assessment should be undertaken within 2 hours if fetal movements are absent and within 12 hours if they are reported as decreased.</li> <li>Women who report DFM should be assessed for the presence of other previously established antenatal risk factors associated with an increased risk of stillbirth like fetal growth restriction, hypertension, diabetes, advanced maternal age etc</li> <li>Woman with DFM in combination with other risk factors should be managed as a high-risk pregnancy.</li> <li>Clinical assessment of a woman with DFM should always include review of fetal growth as noted by symphysis-fundal height measurements in the pregnancy record.</li> </ul>
<b>Investigation – section 2.3</b>	<ul style="list-style-type: none"> <li><b>A cardiotocograph (CTG) should be performed to exclude fetal compromise.</b></li> <li>Further evaluation is recommended for women with any abnormal CTG pattern.</li> <li><b>Ultrasound scan assessment for fetal biometry and amniotic fluid volume should be considered as part of the preliminary investigation where maternal perception of DFM persists despite a normal CTG or in the circumstance of suspected fetal growth restriction.</b></li> <li>Ultrasound scan assessment should include assessment of fetal morphology if this has not already been performed.</li> <li>Where, in the presence of DFM, an ultrasound scan assessment is indicated, this should be performed within 24 hours.</li> <li><b>Testing for feto-maternal haemorrhage should be considered where a CTG abnormality is detected in the presence of an ultrasound scan showing a normally grown fetus.</b></li> </ul>
<b>Further management – section 2.4</b>	<ul style="list-style-type: none"> <li>Where, after further discussion and in the presence of a normal clinical assessment (including a CTG and ultrasound), maternal concern still remains about DFM, further management should be individualised.</li> </ul>

Figure 1 - Flow chart for the management of DFM



## 1.4 Key definitions

### Stillbirth

The complete expulsion or extraction from the mother of a fetus of 20 or more completed weeks of gestation or of 400 grams or more birthweight who did not, at any time after birth, breathe or show any evidence of life such as a heartbeat.

### Live birth

The complete expulsion or extraction from the mother of a fetus of 20 or more completed weeks of gestation or of 400 grams or more birthweight who, after being born, breathes or shows any evidence of life such as a heartbeat.

### **Neonatal death**

The death of a live-born infant within 28 days of birth.

### **Perinatal death**

A stillbirth or neonatal death.

### **Perinatal mortality rate**

The number of perinatal deaths (stillbirths and neonatal deaths) per 1000 births in a year (live births and stillbirths combined).

### **Fetal growth restriction (FGR) / intrauterine growth restriction (IUGR)**

FGR refers to babies that have failed to reach their growth potential during pregnancy. FGR is defined antenatally by an estimated fetal weight or serial antenatal ultrasound evidence of growth restriction or growth arrest and at birth a birthweight below the 10<sup>th</sup> percentile using National birthweight percentiles.

### **Small for gestational age (SGA)**

A baby/fetus with antenatal ultrasound biometry less than 10<sup>th</sup> percentile for gestational age according to National birthweight percentiles. NB growth restricted babies are frequently but not always SGA.

## **2 STRATEGIES**

### **2.1 Antenatal education**

Currently there is no universally agreed definition of DFM. Attempts have been made to define normal patterns of fetal movements. In a study of women with normal uncomplicated pregnancies, 99% of women were able to feel 10 movements within 60 minutes.<sup>6</sup> Studies have been conducted on the correlation between maternal perception of fetal movements and fetal movements detected on ultrasound scans, showing large variations, with correlation rates ranging from 16-90%.<sup>7, 8, 9</sup> This variation in maternal perception may be related to gestational age, amount of amniotic fluid volume, medications, fetal sleep state, obesity, anterior placenta, smoking and nulliparity.<sup>10-12</sup>

Other considerations that complicate the interpretation of fetal health based on the number of fetal movements are the limited understanding of patterns of fetal activity during “sleep” and active cycles, and the changes in the type of movements as pregnancy advances. Fetal movements are usually absent during fetal “sleep” cycles. These quiet cycles occur regularly throughout the day and night and usually last 20 – 40 minutes.<sup>11, 12</sup> Sleep cycles rarely exceed 90 minutes in the normal, healthy fetus.<sup>11-13</sup>

Women with DFM who ask for advice are often told that their baby may respond with movements within 20 minutes after having something very sweet or sugary to eat, or after having an icy cold drink. However, there is no evidence to support this advice. Fetal movements have been shown not to be altered by intravenous glucose administration, or by a recent meal.<sup>14, 15</sup>



It is also important to note that whilst the type of fetal movements may change as pregnancy advances in the third trimester, there is no evidence to suggest that the number of fetal movements decrease as pregnancy advances or during the onset of labour.<sup>4</sup>

At this current time, the most vigorously tested definition of DFM comes from Moore et al who recommend “less than 10 movements within 2 hours when the fetus is active”.<sup>16</sup> This is also the currently recommended alarm limit adopted by the American Academy of Paediatrics and the American College of Obstetricians and Gynaecologists.<sup>17</sup>

## **2.2 Antenatal care**

The recent Cochrane review<sup>18</sup> of four reasonably good quality randomised trials involving a total of 71,370 women, assessed the effect of formal fetal movement counting on perinatal death, major morbidity, maternal anxiety and satisfaction, pregnancy intervention and other adverse pregnancy outcomes. Two of the included studies<sup>19, 20</sup> compared different fetal movement counting methods, and measured their acceptability. One study compared fetal movement counting with biochemical assessment. The fourth and largest study was the cluster-randomised trial by Grant et al<sup>21</sup> comparing formal fetal movement counting (using the Cardiff method) versus no instruction to monitor fetal movements. The control group did include selective use of counting based on clinician preference. The review authors concluded that there was not enough evidence to recommend or not recommend formal fetal movement counting for all women or for women at increased risk of adverse pregnancy outcomes.

The large trial by Grant et al<sup>21</sup> contributing largely to the Cochrane Review findings, however deserves closer review. This multicentre cluster randomised controlled trial was conducted to investigate the role of fetal movement counting in 68,654 women of at least 28 weeks gestation. When compared to women receiving standard antenatal care (including an informal inquiry about fetal movements during antenatal clinic visits), this study found no significant reduction in the stillbirth rates in women undertaking daily fetal movement counting using a “kick-chart”. There was however a trend towards more antenatal admissions in the fetal movement counting group than in the control group. Further, there was an increased use of other fetal testing methods, with more women having cardiotocography in the fetal movement counting group than in the group where movement counting was selective.

Although the trial was subject to some methodological bias due to the use of “within hospital” clusters, the overall stillbirth rate of the intervention and the control group combined fell during the study period from 4 per 1000 to 2.8 per 1000 births. It is postulated that this may be attributed to increased maternal awareness and vigilance of DFM.<sup>21, 22</sup> There was some evidence of an indirect benefit of fetal movement counting as some of the deaths in the fetal movement counting group occurred as a result of poor management following presentation with a live baby.<sup>18, 21</sup>

A reduction in stillbirth rates has been associated with increased awareness of DFM in a recent quality improvement study in Norway.<sup>4</sup> The study used a prospective “before-and-after” study design to evaluate the combined impact of providing women with information on DFM, and clinicians with clinical practice guidelines on DFM. This

combined intervention was associated with a reduction in stillbirth rates, giving an adjusted odds ratio (OR) of 0.67 (95% CI: 0.49-0.94) in the overall study population and an adjusted OR of 0.51 (95% CI: 0.32-0.81) in women with DFM.

A recent literature review<sup>23</sup> of interventions to reduce stillbirth recommended routine fetal movement counting for high risk pregnancies only, especially where there is evidence of FGR. However, this recommendation is limited due to the studies upon which it is based. Limitations of two studies<sup>24, 25</sup> include the methodology used (nonrandomised studies), the small numbers enrolled and changes in the population and in practice which may have occurred since these studies were undertaken; both conducted in the late 1980's.

A concern about the introduction of formal fetal movement counting as a part of routine antenatal care relates to its potential to result in an increase in the number of antenatal hospital visits, interventions and costs without additional benefit. In addition, in line with the trend of increased interventions shown in the Grant trial<sup>21</sup>, a review of three case controlled studies reported that the proportion of women requesting an antenatal visit based on complaints about DFM increased from 6.7 to 8.8%.<sup>22</sup> Monitoring of fetal movements in that population increased the number of antenatal visits in pregnancy by 2-3 per 100 pregnancies.

As opposed to formal fetal movement counting, one study reported that provision of uniform information on fetal movements was associated with a reduced risk of being examined in hospital and was not associated with increased maternal concern and anxiety.<sup>26</sup>

## **2.3 Clinical assessment and investigation**

### **2.3.1 Fetal heart rate monitoring**

The first step in the management of DFM is to ensure the fetus is alive and not in eminent danger of death. Once death is excluded, any coincidental associated pathology should also be excluded as a possible cause for DFM.

A handheld Doppler can immediately confirm the presence of a fetal heart beat. In doubtful cases, a cardiotocography (CTG) may be required to detect a fetal heart beat and to establish the fetal heart rate (FHR) pattern. In both situations a fetal heart beat needs to be differentiated from the maternal heart beat. This is easily done, in most cases, by noting the difference between the FHR and the maternal pulse rate. If the presence of a fetal heart beat is not confirmed, or still in doubt, then an immediate ultrasound scan assessment of fetal cardiac activity must be undertaken.

Once fetal death is excluded, a CTG is used to assess fetal compromise in most health care settings in Australia. Please refer to *PD2010\_040 Maternity – Fetal Heart Rate Monitoring* for further information. Although CTG has become part of clinical practice, the Cochrane review<sup>27</sup>, comprising 4 trials and 1588 women, did not confirm or refute any benefits for routine CTG monitoring of “at risk” pregnancies. However, the authors acknowledge several limitations of this review, including the small numbers of women studied, other methodological concerns, and also the fact that these trials were

conducted in the early 1980s when these tests were just being introduced into clinical practice.

Recent non-randomised studies show some distinct benefits of screening low and at risk pregnancies using CTG monitoring in the presence of DFM. For example, in a Norwegian study of 3014 women who presented with DFM, a CTG was performed in 97.5% of cases and an abnormality was detected in 3.2%.<sup>28</sup> In an observational study of women presenting with DFM who had an initial CTG and an ultrasound scan, 21% had an abnormality initially that required action and 4.4% were admitted for immediate delivery.<sup>29</sup> Another study showed that stillbirth rates (corrected for lethal congenital anomalies), after a normal and abnormal CTG, were 1.9 and 26 per 1000 births, respectively.<sup>30</sup> Although the evidence on the effectiveness of CTG monitoring in the identification of “at-risk” babies is inconclusive, the use of CTG as a screening tool can be justified as an abnormal FHR pattern may be associated with poor outcomes.<sup>31</sup>

### **2.3.2 Ultrasound**

Although evidence is currently lacking to recommend ultrasound assessment for all cases of women presenting with DFM, ultrasonography may be used for the detection of conditions that contribute to DFM. A meta-analysis of three trials, including 1893 women with at risk pregnancies provided with “kick-charts”, illustrated a strong association between fetal growth restriction and DFM (OR 6.34 95% CI 4.19-9.58).<sup>22</sup> In a prospective cohort of 3014 women with DFM<sup>28</sup> detection of an abnormality (FGR, reduced amniotic fluid volume or fetal abnormality) was reported in 11.6% on ultrasound. The CTG in this study was abnormal in only 3.2% of cases and an abnormal umbilical artery Doppler was noted in 1.9%. In a Norwegian study<sup>4</sup>, an investigation protocol of CTG and ultrasound scan was used in the management of women with DFM. The study recommended that both investigations should be performed within 2 hours if women reported no fetal movements and within 12 hours if they reported decreased fetal movements. In this study, the ultrasound scan was conducted to assess amniotic fluid volume, fetal growth and fetal anatomy. The addition of Doppler studies in the investigation protocol did not show any further benefit. Although the number of ultrasound scans more than doubled (OR 2.64, 95% CI 2.02-3.45), this appeared to be compensated with a reduction in additional follow-up consultations and admissions for induction of labour.<sup>4</sup> The study reported no increase in the number of preterm births, infants requiring transfer to neonatal care, or infants with severe neonatal depression or fetal growth restriction. Importantly, a significant reduction in perinatal mortality was shown (OR 0.51, 95%CI 0.32-0.81).

Another study of 489 women with DFM<sup>32</sup> demonstrated that women with DFM, but no other pregnancy risk factor, did not require further follow-up once the CTG and the amniotic fluid volume were confirmed normal. An ultrasound scan was performed to assess amniotic fluid volume in women with DFM and revealed a 3.7 times greater likelihood of a diminished amniotic fluid volume compared to women without DFM.

### **2.3.3 Feto-maternal haemorrhage**

Massive fetal to maternal haemorrhage (varying from >50mls to >150mls) has been demonstrated in approximately 4% of stillbirths and in 0.04% of neonatal deaths.<sup>33, 34</sup> Clinical risk factors do not reliably predict the likelihood of massive fetal to maternal

haemorrhage (FMH)<sup>34</sup> and DFM may be the only history suggesting this possibility.<sup>33, 35-37</sup> A sinusoidal FHR pattern is the classic CTG sign indicating severe fetal anaemia<sup>33</sup>, however this is not present in all cases. It is possible that the only “suspicious” CTG signs may be reduced or absent variability.<sup>38</sup>

## **2.4 Further management**

Following exclusion of fetal compromise at an initial episode of DFM, maternal concern about DFM may still remain or may result in subsequent consultations for DFM. To date, there are no studies to guide the management of women who have ongoing concern about DFM and very little data exists on outcomes for this group of women. Yet, a recent small retrospective study, involving 203 women, showed that women with more than one presentation of DFM were at increased risk of poor pregnancy outcomes.<sup>3</sup>

While research is limited, and with the additional anxiety caused for women and the potential for increased risk, closer surveillance of women with ongoing concerns of DFM would seem appropriate. These management strategies need to take into account the presence of other risk factors and gestation. Early delivery is an option which may be considered. However, a decision to deliver needs to be weighed against the risks to the mother and baby at that particular gestation.<sup>39</sup>

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## **4 LIST OF ATTACHMENTS**

1. Implementation Checklist

## Attachment 1: Implementation checklist

Assessed by:		Date of Assessment:	
IMPLEMENTATION REQUIREMENTS	Not commenced	Partial compliance	Full compliance
1. A Local health District standardised local practice procedure, based on this policy directive, must be implemented within 6 months of issue of this policy directive.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Notes:</u>			
2. All medical, midwifery, nursing and other staff must be educated about the content of this policy directive within 12 months of issue.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Notes:</u>			
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Notes:</u>			
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Notes:</u>			
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Notes:</u>			