Appendix 2. Initial Causes of Fetal Death (INCODE)

Stillbirth Collaborative Research Network	CAUSE OF DEATH REVIEW Version 04 / December 21, 2009	Form 91A

Review Case ID	Member	Review Number	Form Completion Date
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Instructions: Complete the Cause of Death (CoD) Review Form for each stillbirth case reviewed. For multiple births complete a separate form for each stillborn baby using the Member ID (e.g., 1, 2, 3) -- consistent with chart abstraction Member ID designation.

A. Reviewer

1. Reviewer category ..... |__|__|
01=Assigned team 02=Alternate team 03=Individual reviewer 04=Other

2. If other than team assigned by the DCAC (i.e., the assigned team), list last name of reviewers below.

a. _____ **b.** _____

c. _____ **d.** _____

B. Comprehensive Review of Findings Pertinent to Cause of Death

Instructions: Code findings according to the • designation where **01=present**; **02=possible** cause of death; and **03=probable** cause of death. Use the highest code for a finding with the criteria met. For example, if there is systemic lupus erythematosus disease activity (flare) during pregnancy and abruption placentae, the SLE should be coded as 1c3 (probable cause).	01=Present	02=Possible	03=Probable
1. Maternal Medical Conditions during Pregnancy			
a. Hypertensive disorder of pregnancy[1–4]			
1) Hypertensive disease alone	•		
2) Hypertensive disease with <u>at least ONE</u> of the following (**specify if present**):		•	
a) SGA (<10%) ..... *01=Yes, 02=No* ..... |__|__|			
b) Absent or reversed end diastolic flow of umbilical vessels ..... *01=Yes, 02=No* ..... |__|__|			
c) Maternal hypertensive crisis ..... *01=Yes, 02=No* ..... |__|__|			
3) Hypertensive disease with **[**isolated clinical diagnosis of abruption (no retroplacental clot or pathologic evidence of abruption)**]** OR **[**hypertensive disease with isolated retroplacental clot or pathologic evidence of abruption (no clinical evidence of abruption)**]**		•	
4) Hypertensive disease with <u>at least TWO</u> of the following (**specify if present**):			•
a) SGA (<10%) ..... *01=Yes, 02=No* ..... |__|__|			
b) Absent or reversed end diastolic flow of umbilical vessels ..... *01=Yes, 02=No* ..... |__|__|			
c) Maternal hypertensive crisis ..... *01=Yes, 02=No* ..... |__|__|			
5) Hypertensive disease with antepartum clinical diagnosis of abruption and <u>at least ONE</u> of the following (**specify if present**):			•
a) Retroplacental clot ..... *01=Yes, 02=No* ..... |__|__|			
b) Pathologic confirmation with extensive parenchymal infarction ..... *01=Yes, 02=No* ..... |__|__|			
c) Maternal blood transfusion ..... *01=Yes, 02=No* ..... |__|__|			

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d) Massive bleeding with rupture of membranes noted in records.....*01=Yes, 02=No* ..... |__|__|			
e) Eclampsia.....*01=Yes, 02=No* ..... |__|__|			
Specify most appropriate category of the disorder from below ..... **|__|__|**			
01=Preeclampsia			
02=Gestational hypertension			
03=Chronic hypertension			
04=Chronic hypertension with superimposed preeclampsia			
05=Eclampsia			
b. Diabetes during pregnancy[5–8]			
1) Gestational diabetes			
a) Abnormal 3° GTT with FBS <105 or unknown with or without LGA (>90%)	•		
b) Abnormal 3° GTT with FBS ≥105 and LGA (>90%)		•	
2) Pregestational diabetes (type 1 or type 2)			
a) HgbA1C unknown during pregnancy and normal fetal growth	•		
b) HgbA1C <6.5 during pregnancy and normal fetal growth	•		
c) HgbA1C ≥6.5 during pregnancy or unknown, abnormal fetal growth [SGA (<10%) or LGA (>90%)]		•	
d) Diabetic ketoacidosis			•
e) Diabetic embryopathy with lethal anomalies			•
3) Poorly controlled diabetes with majority of blood sugars > 250 mg/dl or if noted in clinical record			•
4) Diabetic fetopathy with significant birth trauma or fetal pathologic changes (e.g. islet cell hyperplasia)			•
c. Systemic lupus erythematosus[9–12] **(SLE)** *(SLE diagnosed by ARA criteria)*			
1) Diagnosed SLE, but no disease activity during pregnancy	•		
2) SLE disease activity (flare) during pregnancy		•	
3) SLE disease activity (flare) during pregnancy associated with <u>at least ONE</u> of the following (**specify if present**):			•
a) Antiphospholipid syndrome (APS) .....*01=Yes, 02=No*.....|__|__|			
b) Abruptio placentae .....*01=Yes, 02=No*.....|__|__|			
c) Severe preeclampsia .....*01=Yes, 02=No*.....|__|__|			
d) Eclampsia.....*01=Yes, 02=No*.....|__|__|			
e) SGA (<10%) / oligohydramnios.....*01=Yes, 02=No*.....|__|__|			
d. Intrahepatic cholestasis of pregnancy[13,14] *(Generalized pruritis with bile acids increased [≥40 µmol/L])*			
1) Bile acids 40-70 µmol/L		•	
2) Bile acids >70 µmol/L			•
e. Thyroid disorders during pregnancy[15–17] *(Diagnosis of hyper or hypothyroidism)*			
1) Medical management and clinically euthyroid	•		
2) Clinical symptoms of hyperthyroidism or hypothyroidism		•	
3) Thyroid storm			•

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f. Renal disease during pregnancy[18–20] *(Elevated serum creatinine)*			
1) Serum creatinine 1.3-1.9 mg/dL without SGA (<10%)	•		
2) Serum creatinine >1.9 mg/dL without SGA (<10%)		•	
3) Serum creatinine ≥1.3 mg/dL with SGA (<10%)		•	
g. Severe maternal infection[21–24] *(Maternal infection – examples: influenza, polio, varicella pneumonia, pyelonephritis, appendicitis)*; **Specify organism, if known** _____			
1) Hospital treatment and fever >100.4 F, or IV antibiotics, or surgery, or ventilatory support >2 weeks prior to the stillbirth or timing not known	•		
2) Hospital treatment and fever >100.4 F, or IV antibiotics, or surgery, or ventilatory support within 2 weeks prior to the stillbirth		•	
3) Hospital treatment and fever >100.4 F, or IV antibiotics, or surgery, or ventilatory support within 48 hours prior to the stillbirth, or hypotension			•
h. Shock during pregnancy[25–27] *(Precipitating event leading to shock presentation not sepsis)*			
1) Corrected with fluid replacement		•	
2) Need for pressor agents			•
i. Asthma during pregnancy[28,29] *(Clinical diagnosis of asthma)*			
1) No evidence of exacerbation, with or without medications	•		
2) Uncontrolled exacerbation or uncontrolled asthma		•	
3) Status asthmaticus, with or without hypoxia documented			•
j. Seizure disorders during pregnancy[30,31] *(Diagnosed seizure disorder)*			
1) Seizure activity during pregnancy absent or ≤1 seizure/month, with our without anti-epileptics	•		
2) Seizure disorder not controlled by medications, occurring >1 seizure/month		•	
3) Status epilepticus			•
k. Maternal substance abuse[32–34] *(Evidence of substance abuse by history or laboratory evaluation)*			
1) Positive drug screen without SGA (<10%) or history of drug use with negative drug screen	•		
2) Positive drug screen with SGA (<10%)		•	
3) Narcotic withdrawal		•	
l. Other maternal medical condition *(Specific maternal condition)* **Specify condition** _____			
1) Condition is diagnosed with no consequences on pregnancy	•		
2) Condition is associated with possible fetal consequences		•	
3) Condition has clear pathophysiology that most likely caused fetal death			•
2. Obstetric Complications			
a. Fetal maternal hemorrhage[35–38] *(Kleihauer-Betke test positive or flow cytometry positive)*			
1) Positive Kleihauer-Betke or flow cytometry <5%	•		
2) 5% to <40% of fetoplacental blood volume		•	
3) ≥40% of fetoplacental blood volume with signs of anemia in the fetus or in the placenta (pallor)			•
b. Cervical insufficiency *(Sonographic evidence of short cervix or evidence on cervical examination) with antepartum death*	•		
c. Preterm labor *(spontaneous preterm labor diagnosed before or after antepartum fetal death)*	•		

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d. Preterm premature rupture of membranes *(PROM diagnosed before or after antepartum fetal death)*	•		
e. Clinical chorioamnionitis *(diagnosed before or after antepartum fetal death)*	•		
f. Intrapartum fetal death with labor –associated asphyxia (prior to or at 26 weeks)[39–44]			•
Specify associated conditions present:			
1) Cervical insufficiency ..... *01=Yes, 02=No*..... |__|__|			
2) Abruptio placentae..... *01=Yes, 02=No*..... |__|__|			
3) Preterm labor..... *01=Yes, 02=No*..... |__|__|			
4) Preterm PROM ..... *01=Yes, 02=No*..... |__|__|			
5) Clinical chorioamnionitis ..... *01=Yes, 02=No*..... |__|__|			
6) Histologic chorioamnionitis ..... *01=Yes, 02=No*..... |__|__|			
g. Hypoxic intrapartum fetal death (after 26 weeks)[45–49] *(Intrapartum fetal death)*			
1) Clinical or pathology evidence of fetal asphyxia (by fetal heart rate monitoring or clinical evaluation) **Specify any contributing maternal or fetal condition** _____			•
h. Abruptio placentae[50–52] *(Clinical diagnosis and/or retroplacental clot on pathology)*			
1) Retroplacental clot noted at any time, but no clinical diagnosis of abruption	•		
2) Clinical diagnosis without retroplacental clot or pathologic confirmation		•	
3) Antepartum clinical diagnosis of abruptio placentae with <u>at least ONE</u> of the following (**specify if present**):			•
a) Retroplacental clot .....*01=Yes, 02=No* ..... |__|__|			
b) Pathologic confirmation with extensive parenchymal infarction.....*01=Yes, 02=No* ..... |__|__|			
c) Maternal blood transfusion.....*01=Yes, 02=No* ..... |__|__|			
d) Massive bleeding .....*01=Yes, 02=No* ..... |__|__|			
i. Complications of multiple gestation[53–57] *(Clinical diagnosis of multiple gestation)*			
1) One or all fetuses dead, no SGA (<10%) or evidence of uteroplacental insufficiency, intervening membranes noted	•		
2) One or all fetuses dead, with SGA (<10%) and/or evidence of uteroplacental insufficiency, intervening membranes noted		•	
3) Complications of monochorionic multiple gestation (e.g., twin to twin transfusion syndrome, TRAP sequence, monoamniotic twinning)			•
j. Uterine rupture[58,59] *(Separation of uterine scar noted at surgery)*			
1) Uterine dehiscence with no extrusion of fetus or cord, no evidence of uteroplacental insufficiency	•		
2) Uterine dehiscence with no extrusion of fetus or cord, with evidence of uteroplacental insufficiency		•	
3) Uterine rupture			•
k. Maternal trauma during pregnancy[60-63] *(Maternal trauma documented in medical record)*			
1) No evidence of maternal or fetal injury from the trauma	•		
2) Evidence of maternal injury with no abruptio placentae, but with presence of fetal cephalhematoma or skull fracture		•	
3) Evidence of maternal injury with abruptio placentae or direct fetal trauma (e.g. subdural hemorrhage)			•

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l. Uteroplacental insufficiency[64–66]			
1) Isolated SGA (less than 10%)	•		
2) AGA (10-90%) with at least ONE of the documented findings specified below	•		
3) SGA (5-10%) with at least ONE of the documented findings specified below		•	
4) SGA <5% with at least ONE of the documented findings specified below			•
Specify documented findings present for 2-4 above:			
Sp_a) Oligohydramnios: AFI less than 5 cm with intact membrane ..... *01=Yes, 02=No*.....|__|__|			
Sp_b) Abnormal Doppler: Absent or reversed end diastolic flow of umbilical vessels ..... *01=Yes, 02=No*.....|__|__|			
Sp_c) Category III fetal heart tracing or a biophysical profile score ≤6 ..... *01=Yes, 02=No*.....|__|__|			
m. Other obstetric condition *(Specific obstetric condition)* **Specify condition** _____			
1) Condition is diagnosed with no consequences on pregnancy	•		
2) Condition is associated with possible fetal consequences		•	
3) Condition has clear pathophysiology that most likely caused fetal death			•
3. Maternal or Fetal Hematologic Conditions			
a. Heritable thrombophilias[67-71]			
1) Positive test only	•		
2) Positive test with SGA (less than 10%)		•	
Specify tests documented positive for 1-2 above:			
Sp_a) Factor V Leiden.....*01=Yes, 02=No* ..... |__|__|			
Sp_b) Prothrombin Gene 20210A .....*01=Yes, 02=No* ..... |__|__|			
Sp_c) Antithrombin III deficiency.....*01=Yes, 02=No* ..... |__|__|			
Sp_d) Protein S deficiency .....*01=Yes, 02=No* ..... |__|__|			
Sp_e) Protein C deficiency .....*01=Yes, 02=No* ..... |__|__|			
b. Antiphospholipid syndrome (APS)[72–74]			
1) Positive test for APS, no SGA (less than 10%) or oligohydramnios present		•	
2) Positive test for APS with SGA (less than 10%) or oligohydramnios present			•
Specify tests documented positive for 1-2 above:			
Sp_a) Lupus anticoagulant.....*01=Yes, 02=No* ..... |__|__|			
Sp_b) Anticardiolipin antibodies .....*01=Yes, 02=No* ..... |__|__|			
c. Red cell isoimmunization[75–78] *(Maternal antibodies against RBC antigen [1:16 or higher] except for any titer Kell antibody)*			
1) No hydrops or fetal anemia	•		
2) Fetal anemia, without hydrops, extramedullary hematopoiesis present		•	
3) Hydrops fetalis			•

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d. Platelet alloimmunization[79–81] *(Maternal antibodies vs. pertinent fetal platelet antigen present)*			
1) Parental platelet incompatibility with normal fetal platelet count and no fetal intracranial hemorrhage	•		
2) Fetal thrombocytopenia		•	
3) Fetal thrombocytopenia with intracranial hemorrhage			•
e. Other maternal or fetal hematologic conditions *(Specific maternal or fetal hematologic condition)* **Specify condition** _____			
1) Condition is diagnosed with no consequences on pregnancy	•		
2) Condition is associated with possible fetal consequences		•	
3) Condition has clear pathophysiology that most likely caused fetal death			•
4. Fetal Genetic, Structural, and Karyotypic Abnormalities			
a. Chromosomal anomalies[82–84]			
1) Aneuploidy, **specify:**_____			•
2) Unbalanced translocation, deletions		•	
3) Confined placental mosiacism with SGA (less than 10%)			•
b. Autosomal recessive disorders[85–88]			
1) Alpha thalassemia causing hydrops			•
2) Storage disease causing hydrops			•
3) Amino acid disorders			•
4) Peroxisomal disorders			•
c. X-linked dominant disorders in males[89]	•		
d. Structural anomalies without chromosomal anomaly[90–102]			
1) Pentalogy of Cantrell/ectopia cordis			•
2) Cardiac anomaly with no hydrops	•		
3) Cardiac anomaly causing hydrops (structural defects/dysrhythmias)			•
4) Intrathoracic anomaly causing hydrops (neoplasia)			•
5) Urogenital anomaly causing anhydramnios (prune belly, bilateral renal agenesis, cloacal dysgenesis)			•
6) Non-immune hydrops (diagnosed prior to fetal death, any cause)			•
7) Lethal type skeletal dysplasia			•
8) Fetal or placental tumors causing hydrops, **specify** _____			•
9) Abdominal wall defects			•
10) Neural tube defects, with no evidence of brain stem compromise		•	
11) Neural tube defects, with evidence of brain stem compromise			•
12) Other structural neurologic abnormalities, **specify**_____		•	
13) Fetal lung abnormalities (CCAM, hypoplasia), with or without congenital diaphragmatic hernia		•	
14) Endocrine gland agenesis, hypoplasia, or dysfunction		•	
15) Neuromuscular disorders (myotonic/muscular dystrophies)		•	
16) Any structural abnormality without chromosomal anomaly (1-15 above) with hydrops (if not already specified) or major structural abnormality likely leading to death, **specify**_____			•

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e. Fetal metabolic disorders[103–104]; Specify _____			
1) Inborn errors of metabolism: systemic effects			•
2) Inborn errors of metabolism: degenerative neurologic disease			•
f. Other chromosomal, genetic or structural abnormality **Specify, if known** _____			
1) Condition is not likely associated with fetal consequences	•		
2) Condition is associated with possible fetal consequences		•	
3) Condition has clear pathophysiology that most likely caused fetal death			•
5. Placental and/or Fetal Infection (Excluding Fetal Membranes)			
a. Fetal infection involving vital organs: brain, heart, lung & liver[105–115] *(Positive bacterial or viral culture, or viral-specific PCR – examples: listeriosis, group B streptococcus, Escherichia coli, other viruses, protozoa)* **Specify organism, if known** _____			
1) Culture or PCR proven infection in vital organs with no documented histologic signs of infection	•		
2) Culture or PCR proven infection in vital organs with signs of infection in the placenta but not organs		•	
3) Histologic evidence of infection in vital organs without culture or PCR proven infection in vital organs		•	
4) Histologic evidence of infection in vital organs with culture or PCR proven infection in vital organs			•
5) Pathognomonic pathologic findings in fetus with or without culture or PCR proven infection			•
b. Fetal infection that causes congenital anomaly or other fetal condition[116–119] *(Fetal infection with a teratogenic organism – examples: parvovirus, varicella, CMV, toxoplasmosis)* **Specify organism, if known** _____			
1) Organism known to cause fetal anomaly/condition, anomaly/condition is present, timing of infection not consistent with specific anomaly/condition	•		
2) Organism known to cause fetal anomaly/condition, anomaly/condition is present, timing of infection is unknown		•	
3) Organism known to cause fetal anomaly/condition, anomaly/condition is present, timing of infection consistent with expected anomaly (including neuronal injury or calcifications)			•
4) Pathognomonic pathologic findings in fetus or placenta with or without culture or PCR proven infection			•
c. Placental infection - organism likely to lead to decreased placental function[120-123] *(Maternal infection with organism known to decrease placental function - examples: malaria, syphilis)* **Specify organism, if known** _____			
1) Culture or PCR proven infection without placental histologic changes characteristic of infection or in the absence of placental histology	•		
2) Culture or PCR proven infection and placental histologic changes characteristic of infection such as villitis and placentitis (minimal placental involvement)		•	
3) Culture or PCR proven infection and placental histologic changes characteristic of infection such as villitis and placentitis (extensive placental involvement)			•
4) Pathognomonic pathologic findings in placenta with or without culture or PCR proven infection			•

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d. Infection-related fetal death by other or unknown mechanisms *(placental or fetal infection, possible mechanism different from other categories)* **Specify organism, if known** _____			
1) Presence of maternal or fetal infection, no clear pathophysiologic sequence leading to fetal death	•		
2) Presence of maternal or fetal infection, plausible pathophysiologic sequence leading to fetal death		•	
3) Presence of maternal or fetal infection, likely pathophysiologic sequence leading to fetal death			•
4) Pathognomonic pathologic findings in fetus or placenta with or without culture or PCR proven infection			•
6. Pathologic Placental Conditions[124–136]			
a. Placental Disc[137–141]			
1) Implantation site abnormalities			
a) Placenta previa	•		
b) Placenta percreta, increta, accreta		•	
2) Abnormal development of villous parenchyma			
a) Delayed villous maturation		•	
b) Accelerated villous maturation		•	
c) Partial mole			•
b. Placental membranes[142]			
1) Circumvallate, velamentous, or furcated cord insertion with compromise		•	
2) Early amnion rupture sequence			•
3) Amnion nodosa	•		
c. Umbilical cord[143–149]			
1) Vasa previa			
a) With no bleeding	•		
b) With bleeding			•
2) Umbilical cord entrapment (includes nuchal cord, body cord, shoulder cord or other evidence that umbilical cord is constricted by the fetus)			
a) With no evidence of occlusion	•		
b) With evidence of cord occlusion		•	
c) With evidence of cord occlusion and fetal hypoxia			•
3) True knots, false knots, torsions, strictures			
a) With no thrombi or other obstruction	•		
b) With thrombi or other obstruction			•
4) Cord prolapse			•
d. Fetal membranes and placental inflammatory disorders[150–157]			
1) Histologic chorioamnionitis with antepartum fetal death	•		
2) Histologic chorioamnionitis and funisitis with antepartum fetal death		•	
3) Histologic chorioamnionitis and funisitis with intrapartum fetal death after 26 weeks of gestation		•	

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e. Circulatory disorders[158–177]			
1) Compromised maternal circulation: vascular lesions			
a) Extensive decidual vasculopathy	•		
b) Extensive villous (parenchymal) infarcts			•
c) Extensive intraplacental thrombi (hematoma)			•
d) Massive subchorionic hematoma			•
e) Subamnionic hemorrhage	•		
2) Compromised maternal circulation: nonvascular lesions			
a) Minor perivillous parenchymal fibrin deposition	•		
b) Massive perivillous parcenchymal fibrin deposition			•
c) Maternal floor fibrin deposition (maternal floor infarct: covers parenchyma with 1 cm or more deposition of basal plate)			•
3) Compromised fetal microcirculation			
a) Thromboembolism of umbilical vein or large fetal vessels, no evidence of or partial obstruction		•	
b) Thromboembolism of umbilical vein or villous fetal capillaries and avascular villi, with evidence of obstruction			•
4) Compromise of maternal/fetal circulations			
a) Placental and/or fetal hydrops			•
f. Other placental abnormalities *(Specific placental abnormality diagnosed)* **Specify condition** _____			
1) Condition is diagnosed with no consequences on pregnancy	•		
2) Condition is associated with possible fetal consequences		•	
3) Condition has clear pathophysiology that most likely caused fetal death			•
7. Other Pertinent Condition Not Specified in Sections 1-6			
Specify condition _____			
1) Condition is present that is pertinent to the evaluation of the fetal death	•		
2) Condition is associated with possible fetal consequences		•	
3) Condition has clear pathophysiology that most likely caused fetal death			•

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Review Case ID	Member	Review Number	Form Completion Date
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C. Synopsis

1. Review complete.....*01=Yes, 02=No* ..... |__|__|

If NO ➔

a. Are there questions for the clinical site?.....*01=Yes, 02=No* ..... |__|__|

If YES ➔ Specify

b. Are there questions for a pathologist?.....*01=Yes, 02=No* ..... |__|__|

If YES ➔ Specify

c. Are there questions for a geneticist?.....*01=Yes, 02=No* ..... |__|__|

If YES ➔ Specify

d. Is any additional input required?.....*01=Yes, 02=No* ..... |__|__|

If YES ➔ Specify

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SCRN Stillbirth Collaborative Research Network	CAUSE OF DEATH REVIEW Version 04 / December 21, 2009	Form 91A

Review Case ID	Member	Review Number	Form Completion Date
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2. Are there key data found in narrative reports that are not found or that are entered incorrectly in the SCRN database? ..... *01=Yes, 02=No* ..... |__|__|

If YES ➔ Specify

3. Provide a narrative in the space below

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

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Narrative

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The authors provided this information as a supplement to their article.

References

1. Allen VM, Joseph K, Murphy KE, Magee LA, Ohlsson A. The effect of hypertensive disorders in pregnancy on small for gestational age and stillbirth: a population based study. BMC Pregnancy Childbirth2004:4:17.

2. Ananth CV, Basso O. Impact of pregnancy-induced hypertension on stillbirth and neonatal mortality. Epidemiology 2010;21:118-123.

3. Neutra R. Fetal death in eclampsia: I. Its relation to low gestational age, retarded fetal growth, and low birthweight. Br J Obstet Gynecol 1975;82:382-389.

4. Xiong X, Buekens P, Pridijian G, Fraser WD. Pregnancy-induced hypertension and perinatal mortality. J Reprod Med 2007;52:402-406.

5. Cundy T, Gamble G, Townend K, et al. Perinatal mortality in type 2 diabetes mellitus. Diabet Med 2000;17:33-39.

6. Dudley DJ. Diabetic-associated stillbirth: incidence, pathophysiology, and prevention. Clinics in Perinatology 2007;34:611-626.

7. Langer O, Yogev Y, Most O, et al. Gestational diabetes: the consequences of not treating. Am J Obstet Gynecol 2005;192:989-997.

8. Laurenborg J, Mathiesen E, Ovesen P, et al. Audit on stillbirths in women with pregestational type 1 diabetes. Diabetes Care 2003;26:1385-1389.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

9. Dhar JP, Essenmacher LM, Ager JW, Sokol RJ. Pregnancy outcomes before and after a diagnosis of systemic lupus erythematosus. Am J Obstet Gynecol 2005;193:1444-1455.

10. Branch DW. Immunologic disease and fetal death. Clin Obstet Gynecol 1987;30:295-311.

11. Rahman FZ, Rahman J, Al-Suleiman SA, Rahman MS. Pregnancy outcome in lupus nephropathy. Obstet Gynecol Surv 2004:59:754-755.

12. Yuen SY, Krizova A, Ouimet JM, Pope JE. Pregnancy outcome in systemic lupus erythematosus (SLE) is improving: results from a case control study and literature review. Open Rheumatol J 2008;2:89-98.

13. Glantz A, Marschall AU, Mattsson LA. Intrahepatic cholestasis of pregnancy: relationships between bile acid levels and fetal complication rates. Hepatology 2004;40:467-474.

14. Geenes V, Williamson C. Intrahepatic cholestasis of pregnancy. World J Gastroenterol 2009;15:2049-2066.

15. Allan WC, Haddow JE, Palomaki GE, Williams JR, Mitchell ML, Hermos RJ, Faix JD, Klein RZ. Maternal thyroid deficiency and pregnancy complications: implications for population screening. J Med Screen 2000;7:127-130.

16. Jones W, Man E. Thyroid function in human pregnancy. VI. Premature deliveries and reproduction failure of pregnant women with low butanol extractable iodines. Am J Obstet Gynecol 1969;104:909-914.

17. Davis LE, Lucas MJ, Hankins GDV, Roark ML, Cunningham FG. Thyrotoxicosis complicating pregnancy. Am J Obstet Gynecol 1989;160:63-70.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

18. Fischer MJ. Chronic kidney disease and pregnancy: maternal and fetal outcomes. Adv Chr Kidney Dis 2007;14:132-145.

19. Holley JL, Bernandini J, Quadri KH, Greenberg A, Laifer SA. Pregnancy outcomes in a prospective matched control study of pregnancy and renal disease. Clin Nephrol 1996;45:77-82.

20. Wagner SJ, Craici I, Reed D, et al. Maternal and fetal outcomes in pregnant patients with active lupus nephritis. Lupus 2009;18:342-347.

21. Brocklehurst P, French R. The association between HIV infection and perinatal outcome: a systematic review of the literature and meta-analysis. Br J Obstet Gynecol 1998;105:836-848.

22. Campuzano K, Roque H, Bolnick A, Leo MV, Campbell WA. Bacterial endocarditis complicating pregnancy: case report and systematic review of the literature. Arch Gynecol Obstet 2003;268:251-255.

23. Cartin-Ceba R, Gajic O, Iyer VN, Vlahakis NE. Fetal outcomes of critically ill pregnant women admitted to the intensive care unit for non-obstetric causes. Crit Care Med 2008;36:2746-2751.

24. Cohen-Kerem R, Railton C, Oren D, Lishner M, Koren G. Pregnancy outcome following non-obstetric surgical intervention. Am J Surg 2005;190:467-473.

25. Dilts PV, Brinkman CR, Kirschbaum TH, Assali NS. Uterine and systemic hemodynamic interrelationships and their response to hypoxia. Am J Obstet Gynecol 1969;103:138-157.

26. Griess FC. Uterine vascular response to hemorrhage during pregnancy. Obstet Gynecol 1966;27:549-554.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

27. Rogers FB, Rozcyki GS, Osler TM, et al. A multi-institutional study of factors associated with fetal death in injured pregnant patients. Arch Surg 1999;134:1274-1277.

28. Clifton VL, Engel P, Smith R, Gibson P, Brinsmead M, Giles WB. Maternal and neonatal outcomes of pregnancies complicated by asthma in an Australian population. Aust NZ J Obstet Gynecol 2009;49:619-626.

29. Wen SW, Demissie K, Liu S. Adverse outcomes in pregnancies of asthmatic women: results from a Canadian population. Ann Epidemiol 2001;11:7-12.

30. Hiilesmaa VK, Bardy A, Teramo K. Obstetric outcome in women with epilepsy. Am J Obstet Gynecol 1985;152:499-504.

31. Teramo K, Hiilesmaa VK. Pregnancy and fetal complications in epileptic pregnancies. In: D. Janz, M.Dam, L. Bossi, H Helge, A Richens, and D Schmidt, editors. Epilepsy, pregnancy and the child. Raven Press, New York. 1982,pp 53-59.

32. Kistin N, Handler A, Davis F, Ferre C. Cocaine and cigarettes. Paediat Perinat Epidemiol 1996;10;269-278.

33. McDonald SD, Vermeulen MJ, Ray JG. Risk of fetal death associated with maternal drug dependence and placental abruption: a population-based study. J Obstet Gynaecol Can 2007;29:556-559.

34. Young SL, Vosper HJ, Phillips SA. Cocaine: its effects on maternal and child health. Pharmacotherapy 1992;12:2-17.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

35. Varli IH, Petersson K, Bottinga R, et al. The Stockholm classification of stillbirth. Acta Obstet Gynecol Scand 2008;97:1202-1212.

36. De Almeida V, Bowman JM. Massive fetomaternal hemorrhage: Manitoba experience. Obstet Gynecol 1994;83:323-328.

37. Fliegner JR, Fortne DW, Barrie JU. Occult fetomaternal hemorrhage as a cause of fetal mortality and morbidity. Aust NZ J Obstet Gynecol 1987;27:158-161.

38. Laube DW, Schauberger CW. Fetomaternal bleeding as a cause for “unexplained” fetal death. Obstet Gynecol 1982;60:649-651.

39. Bottoms SF, Paul RH,, Iams JD, Mercer BM, Thom EA, Roberts JM, et al. Obstetric determinants of neonatal survival: influence of willingness to perform cesarean delivey on survival of extremely low-birth-weight infants. Am J Obstet Gynecol 1997; 176:960-966.

40. Burke CJ, Tannenberg AE. Intrapartum stillbirths in hospital unrelated to uteroplacental vascular insufficiency. Pediatr Dev Pathol 2007;10:35-40.

41. Draper ES, Zeitlin J, Fenton AC, et al. Investigating the variations in survival rates for very preterm infants in 10 European regions: the MOSAIC birth cohort. Arch Dis Child Fetal Neonatal Ed 2009;94:F158-F163.

42. Falk SJ, Campbell LJ, Lee-Parritz A, Cohen AP, Ecker J, Wilkins-Haug L, Lieberman E. Expectant management in spontaneous preterm premature rupture of membranes between 14 and 24 weeks gestation. J Perinatol 2004;24:611-616.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

43. Koilee LA, Cuttini M, Delmas D, et al. Obstetric interventions for babies born before 28 weeks of gestation in Europe: results of the MOSAIC study. Br J Obstet Gynecol 2009;116:1481-1491.

44. Verma U, Goharkhay N, Beydoun S. Conservative management of preterm premature rupture of membranes between 18-23 weeks of gestation—maternal and neonatal outcome. Eur J Obstet Gynecol Reprod Biol 2006;128:119-124.

45. Newton ER, Kennedy JL, Louis F, Cetrulo CL, Sbarra A, Feingold M. Obstetric diagnosis and perinatal mortality. Am J Perinatol 1987;4:300-304.

46. Parer JT. Effects of fetal asphyxia on brain cell structure and function: limits of tolerance. Comp Biochem Physiol A Mol Integr Physiol 1998;119:711-716.

47. Pasupathy D, Wood AM, Pell JP, Fleming M, Smith GC. Rates of and factors associated with delivery-related perinatal death among term infants in Scotland. JAMA 2009;302:660-668.

48. Alessandri LM, Stanley FJ, Read AW. A case-control study of intrapartum stillbirths. Br J Obstet Gynecol 1992;99:19-23.

49. Whitfield CR, Smith NC, Cockburn F, Gibson AA. Perinatally related wastage—a proposed classification of primary obstetric factors. Br J Obstet Gynecol 1986;93:694-703.

50. Ananth CV, Berkowitz GS, Savitz DA, Lapinski RH. Placental abruption and adverse pregnancy outcomes. JAMA 1999;282:1646-1651.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

51. Ananth CV, Wilcox AJ. Placental abruption and perinatal mortality in the United States. Am J Epidemiol 2001;153:332-337.

52. Oyelese Y, Ananth CV. Placental abruption. Obstet Gynecol 2006;108:1005-1016.

53. Lau TK, Li CY. A perinatal audit of stillbirths in a teaching hospital in Hong Kong. Aust NZ J Obstet Gynecol 1994;34:416-421.

54. Habli M, Lim FY, Crombelhome T. Twin-to-Twin Transfusion Syndrome: A Comprehensive Update. Clin Perinatol 2009;36:391–416.

55. De Paepe ME, et al. Vascular distribution patterns in monochorionic twin placentas. Placenta 2005;26:471-475.

56. De Paepe ME, et al., Placental markers of twin-to-twin transfusion syndrome in diamniotic–monochorionic twins: A morphometric analysis of deep artery-to-vein anastomoses. Placenta (2010), doi:10.1016/j.placenta.2009.12.024.

57. Rizzuto MI, Cottam R, Bradley RJ. Twin reversed arterial perfusion (TRAP) sequence: a rare late finding in a monochorionic twin pregnancy. J Obstet Gynaecol. 2009;29(6):549-550.

58. Chauhan SP, Martin JN, Henrichs CE, Morrison JC, Magann EF. Maternal and perinatal complications with uterine rupture in 142,075 patients who attempted vaginal birth after cesarean delivery: a review of the literature. Am J Obstet Gynecol 2003;189:408-417.

59. Leung AS, Leung EK, Paul RH. Uterine rupture after previous cesarean delivery: maternal and fetal consequences. Am J Obstet Gynecol 1993;169:945-950.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

60. El-Kady D, Gilbert WM, Anderson J, Danielsen B, Towner D, Smith LH. Trauma during pregnancy: an analysis of maternal and fetal outcomes in a large population. Am J Obstet Gynecol 2004;190:1661-1668.

61. Hoff WS, D'Amelio LF, Tinkhoff GH, et al. Maternal predictors of fetal demise in trauma during pregnancy. Surg Gynecol Obstet 1991;172:175-180.

62. Schiff MA, Holt VL, Daling JR. Maternal and fetal outcomes after injury during pregnancy in Washington state from 1989-1997. J Trauma 2002;53:939-945.

63. Weiss HB, Songer TJ, Fabio A. Fetal deaths related to maternal injury. JAMA 2001;286:1863-1868.

64. Amir H, Weintraub A, Aricha-Tamir B, Apel-Sarid L, Holcberg G, Sheiner E. A piece in the puzzle of intrauterine fetal death: pathological findings in placentas from term and preterm intrauterine fetal death pregnancies. J Matern Fetal Neonatal Med 2009;22:759-764.

65. Kahn B, Lumey LH, Zybert PA, Lorenz JM, Cleary-Goldman J, D'Alton ME, Robinson JN. Prospective risk of fetal death in singleton, twin, and triplet gestations: implications for practice. Obstet Gynecol 2003;102:685-692.

66. Larsen LG, Graem N. Morphological findings and value of placental examination at fetal and perinatal autopsy. APMIS 1999;107:337-345.

67. Saade GR, McLintock C. Inherited thrombophilia and stillbirth. Semin Perinatol 2002:26:51-69.

68. Robertson L, Wu O, Langhorne P, et al. Thrombophilia in pregnancy: a systematic review. Br J Haematol 2006;132:171-196.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

69. Dizon Townson D, Miller C, Sibai B, et al. The relationship of the factor V Leiden mutation and pregnancy outcomes for mother and fetus. Obstet Gynecol 2005;106:517-524.

70. Said JM, Higgins JR, Moses EK, et al. Inherited thrombophilia polymorphisms and pregnancy outcomes in nulliparous women. Obstet Gynecol 2010;115:5-13.

71. Silver RM, Zhao Y, Spong CY, et al. Prothrombin gene G20210A mutation and obstetric complications. Obstet Gynecol 2010;115:14-20.

72. Miyakis S, Lockshin M, Atsumi T, Branch DW, et al. International consensus statement on an update of the classification criteria for definite antiphospholipid antibody syndrome. J Thromb Haemostas 2006;42:294–306

73. Antiphospholipid Syndrome. ACOG Practice Bulletin No. 68. American College of Obstetrician Gynecologists. Obstet Gynecol 2005;106:1113-1121.

74. Empson M, Lassere M, Craig J, Scott J. Prevention of recurrent miscarriage for women with antiphospholipid antibody or lupus anticoagulant. The Cochrane Database of Systemic Reviews 2005, Issue 2. Art. No: CD002859. DOI: 10.1002/14651858. CD002859.pub2.

75. Bowman JM, Pollock JM, Manning FA, Harman CR, Menticoglou S. Maternal Kell blood group alloimmunization. Obstet Gynecol 1992;79:239-244.

76. Friesen RF, Bowman JM. The role played by Rh immunization in pregnancy wastage. Can Med Assoc J 1965;93:1333-1335.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

77. Moise KJ. Management of rhesus alloimmunization in pregnancy. Obstet Gynecol 2008;112:164-176.

78. Moise KJ. Fetal anemia due to non-Rhesus-D red cell alloimmunization. Semin Fetal Neonatal Med 2008;13:207-214.

79. Berowitz RL, Bussel JB, McFarland JG. Alloimmune thrombocytopenia: state of the art 2006. Am J Obstet Gynecol 2006;195:907-913.

80. Kaplan C. Alloimmune thrombocytopenia of the fetus and the newborn. Blood Rev 2002;16:69-72.

81. Murphy MF, Hambley H, Nicolaides K, Waters AH. Severe fetomaternal alloimmune thrombocytopenia presenting with fetal hydrocephalus. Prenat Diagn 196;16:1152-1155.

82. Korteweg FJ, Bouman K, Erwich JJ, et al. Cytogenetic analysis after evaluation of 750 fetal deaths: proposal for diagnostic workup. Obstet Gynecol 2008;111:865-74.

83. Won RH, Currier RJ, Lorey F, Towner DR. The timing of demise in fetuses with trisomy 21 and trisomy 18. Prenat Diagn 2005;25:608-11.

84. Stipoljev F, Latin V, Kos M, Miskovic B, Kurjak A. Correlation of confined placental mosaicism with fetal intrauterine growth retardation: a case control study of placentas at delivery. Fetal Diagn Ther 2001;16:4-9.

85. Leung WC, Leung KY, Lau ET, Tang MH, Chan V. Alpha-thalassaemia. Semin Fetal Neonatal Med 2008;13:215-222.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

86. Sim KG, Hammond J, Wilcken B. Strategies for the diagnosis of mitochondrial fatty acid ß-oxidation disorders. Clin Chim Acta 2002;323:37-58.

87. Kopper AJ, Janssens PM, de Groot AN, et al. Lysosomal storage diseases in non-immune hydrops fetalis pregnancies. 2006;371:176-182.

88. Poggi-Travert F, Fournier B, Poll-The BT, Saudubray JM. Clinical approach to inherited peroxisomal disorders. J Inherit Metab Dis 1995;18(supp 1):1-18.

89. Wapner RJ, Lewis D. Genetics and metabolic causes of stillbirth. Sem Perinatol 2002;26:70-74.

90. Bond SJ, Harrison MR, Schmidt KG, Silverman NH, et al. Death due to high-output cardiac failure in fetal saccrococcygeal teratoma. J Pediatr Surg 1990;25:1287-1291.

91. De Galan-Roosen AE, Kujipers JC, Meershoek AP, van Velzen D. Contribution of congenital malformations to perinatal mortality: a 10 year prospective regional study in The Netherlands. Eur J Obstet Gynecol Reprod Biol 1998;80:55-61.

92. Fratelli N, Papageroghiou AT, Bhide A, Sharma A, Okoye B, Thilagnanthan B. Outcome of antenatally diagnosed abdominal well defects. Ultrasound Obstet Gynecol 2007;30:266-270.

93. Grant EK, Evans MJ. Cardiac findings in fetal and pediatric autopsies: a five-year retrospective review. Pediatr Dev Pathol 2009;12:103-110.

94. Haack MC, Oosterhof H, Mouw RJ, Oepkes D, Vandenbusshce FP. Pathophysiology and treatment of fetal anemia due to placental chorioangioma. Ultrasound Obstet Gynecol 1999;14:68-70.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

95. Kalter H. Five decade international trends in the relation of perinatal mortality and congenital malformations: stillbirth and neonatal death compared. Int J Epidemiol 1991;20:173-179.

96. Nakamura Y, Komatsu Y, Yano HK, et al. Nonimmunologic hydrops fetalis: A clinicopathological study of 50 autopsy cases. Pediatr Pathol 1987;7:19–30.

97. Machin GA. Hydrops revisited: literature review of 1,414 cases published in the 1980s. Am J Med Genet 1989;34:366-90.

98. Nakamura Y, Komatsu Y, Yano H, Kitazono S, Hosokawa Y, Fukuda S, Kawano S, Nagasue N, Matsunaga T, Aiko Y, et al. Nonimmunologic hydrops fetalis: A clinicopathological study of 50 autopsy cases. Pediatr Pathol 1987;7:19–30.

99. Seppanen U. The value of perinatal post-mortem radiography. Experience of 514 cases. Ann Clin Res 1985;17supp44:1-59.

100. Vanderheyden T, Kumar S, Fisk NM. Fetal renal impairment. Semin Neonatal 2003;8:279-289.

101. Wilson RD. In utero therapy for fetal thoracic abnormalities. Prenat Diagn 2008;28:619-625.

102. Young ID, Rickett AB, Clarke M. Genetic analysis of malformations causing perinatal mortality. J Med Genet 1986;23:58-63.

103. Christodoulou J, Wilcken B. Perimortem laboratory investigation of genetic metabolic disorders. Sem Neonatol 2004;9:275-280.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

104. Menten B, Swerts K, Delle Chiaie, et al. Array comparative genomic hybridization and flow cytometry analysis of spontaneous abortions and mors in utero samples. BMC Med Genet 2009;10:89.

105. Bittencourt AL, Garcia AG. The placenta in hematogenous infections. Pediatr Pathol Mol Med 2002;21(4):401-432.

106. Gibbs RS. The origins of stillbirth: infectious diseases. Semin Perinatol. 2002;26(1):75-78.

107. Goldenberg RL, McClure EM, Saleem S, Reddy UM. Infection-related stillbirths. Lancet (published online March 10, 2010, DOI:10.1016/S0140-6736(09)61712-8).

108. Goldenberg RL, Culhane JF, Johnson D. Maternal infection and adverse fetal and neonatal outcomes. Clin Perinatol 2005;32:523-559.

109. McClure EM, Goldenberg RL. Infection and stillbirth. Semin Fetal Maternal Med 2009;14:182-189.

110. Rawlinson WD, Hall B, Jones CA, et al. Viruses and other infections in stillbirth: what is the evidence and what should we be doing? Pathology 2008;40:149-160.

111. Gibbs RS, Roberts DJ. Case 27-2007: A 30-year-old pregnant woman with intrauterine fetal death. N Engl J Med 2007; 357:918-925.

112. Goldenberg RL, Thompson C. The infectious origins of stillbirth. Am J Obstet Gynecol 2003;189:861-873.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

113. Omoy A, Tenenbaum A. Pregnancy outcome following infections by coxsackie, echo, measles, mumps, hepatitis, polio and encephalitis viruses. Reprod Toxicol 2006;21:446-457.

114. Satosar A, Ramirez NC, Bartholomew D, Davis J, Nuovo GJ. Histologic correlates of viral and bacterial infection of the placenta associated with severe morbidity and mortality in the newborn. Hum Pathol 2004;35:536–545.

115. Smith B, Kemp M, Ethelberg S, Schiellerup P, Bruun BG, Gerner-Smidt P, Christensen JJ. Listeria monocytogenes: maternal-foetal infections in Denmark 1994-2005. Scand J Infect Dis 2009;41:21-25.

116. Enders M, Weidner A, Zoellner I, Searle K, Enders G. Fetal morbidity and mortality after acute human parvovirus B19 infection in pregnancy: a prospective evaluation of 1018 cases. Prenat Diagn 2004; 24:513-518.

117. Jones JL, Lopez A, Wilson M, Schulkin J, Gibbs R. Congenital toxoplasmosis: A review. Obstet Gynecol Surv 2001;56:296-305.

118. Maruyama Y, Sameshima H, Kamitomo M, Ibara S, Kaneko M, Ikenoue T, et al. Fetal manifestations and poor outcomes of congenital cytomegalovirus infections: Possible candidates for intrauterine antiviral treatments. J Obstet. Gynaecol Res 2007;33:619–623.

119. Tolfvenstam T, Papadogiannakis N, Norbeck O, Petesson K, Broliden K. Frequency of human parvovirus B19 infection in intrauterine fetal death. Lancet 2001;357:1494-1497.

120. McGregor IA, Wilson ME, Billewicz WZ. Malaria infection of the placenta in the Gambia, West Africa: its incidence and relationship to stillbirth, birth weight, and placenta weight. Trans R Soc Trop Med Hyg 1983;77:232-244.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

121. Schwarz ND, Adegnika AA, Breitling LP, Gabor J, Agnandji ST, Newman RD, Lell B, et al. Placental malaria increases malaria risk in the first 30 months of life. Clin Infect Dis 2008; 47:1017-1025.

122. Skeketee RW, Nahlen BL, Parise ME, Menendez C. The burden of malaria in pregnancy in malaria-endemic areas. Am J Trop Med 2001;64:28-35.

123. Van Geertruyden JP, Thomas F, Erhart A, D'Alessandro U. The contribution of malaria in pregnancy to perinatal mortality. Am J Trop Med Hyg 2004; 71(Supp):35-40.

124. ACOG Committee Opinion No. 383: Committee on Genetics. Evaluation of stillbirths and neonatal deaths. Obstet Gynecol. 2007;110:963-966.

125. Altshuler G, Deppisch LM. College of American Pathologists Conference XIX on the examination of the placenta: Report of the working group on indications for placental examination. Arch Pathol Lab Med 1991;115: 701-703.

126. Benirschke K, Kaufmann P. The Pathology of the Human Placenta. 5th Ed. New York: Springer, 2006.

127. College of American Pathologists Conference XIX, The Examination of the Placenta: Patient Care and Risk Management. Arch Pathol Lab Med 1991;115:660–721.

128. Driscoll SG, Langston C. College of American Pathologists Conference XIX on the Examination of the Placenta: Report of the Working Group on Methods for Placental Examination. Arch Pathol Lab Med 1991;115:704-708.

129. Kaplan C, Lowell DM, Salafia C. College of American Pathologists Conference XIX on the Examination of the Placenta: report of the Working Group on the Definition of Structural Changes Associated with Abnormal Function in the Maternal/Fetal/Placental Unit in the Second and Third Trimesters. Arch Pathol Lab Med 1991;115:709-716.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

130. Korteweg FJ, Gordijn SJ, Timmer A, Holm JP, et al. A placental cause of intrauterine fetal death depends on the perinatal mortality classification system used. Placenta 2008;29:71-80.

131. Korteweg FJ, Erwich JJ, Holm JP, Ravise JM, et al. Diverse placental pathologies as the main causes of fetal death. Obstet Gynecol 2009;114:809-817.

132. Kraus FT, Redline RW, et al. Placental Pathology. AFIP —Atlas of Non-tumor Pathology, Fascicle 3, 2004.

133. Langston C, Kaplan C, Macpherson T, et al. Practice guideline for examination of the placenta. Developed by the placental pathology practice guideline development task force of the College of American Pathologists. Arch Pathol Lab Med 1997;121:449–476.

134. Rayburn W, Sander C, Barr M, Rygiel R. The stillborn fetus: placental histologic examination in determining a cause. Obstet Gynecol 1985;65:637–640.

135. Stallmach T, Hebisch G. Placental pathology: its impact on explaining prenatal and perinatal death. Virchows Arch 2004;445:9-16.

136. Travers H, Schmidt WA. College of American Pathologists Conference XIX on the Examination of the Placenta: introduction. Arch Pathol Lab Med 1991;115:660-721.

137. Naeye RL. Placenta previa, predisposing factors and effects on the fetus and surviving infants. Obstet Gynecol 1978;52:521–525.

138. Fox H. Placenta accreta, 1945–1969. Obstet Gynecol Surg 1972;27:475–490.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

139. Fox H. and Sebire N. Placenta accreta, in The Pathology of the Placenta. 3rd edition. New York, Saunders and Elsevier, 2007.

140. Stallmach T, Hebisch G, Meier K, Dudenhausen JW, Vogel M. Rescue by birth: defective placental maturation and late fetal mortality. Obstet Gynecol 2001;97:505-509.

141. Szulman AE, Phillipe E, Boue JG, Boue A. Human triploidy: association of partial hydatidiform moles and nonmolar conceptuses. Hum Pathol 1981;12:1016-1021.

142. Uyanwah-Akporm P, Fox H. The clinical significance of marginal and velamentous insertion of the cord. Br J Obstet Gynaecol. 1977;84:941–943.

143. Ben-Arie A, Weissman A, Steinberg Y, Levy R, Hagay Z. Oligohydramnios, intrauterine growth retardation and fetal death due to umbilical cord torsion. Arch Gynecol Obstet. 1995;256:159-161.

144. Collins JH. Umbilical cord accidents: human studies. Semin Perinatol. 2002;26:79-82.

145. Enakpene CA, Omigbodun AO, Arowojolu AO. Perinatal mortality following umbilical cord prolapse. Int J Obstet Gynecol 2006;95:44-45.

146. Heifetz SA. The Umbilical Cord: Obstetrically Important Lesions. Clin Obstet Gynecol. 1996;39(3):571-587.

147. Oleyese KO, Turner M, Lees C, Campbell S. Vasa previa: an avoidable obstetric tragedy. Obstet Gynecol Surv 1999;54:138-145.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

148. Parast MM, Crum CP, Boyd TK. Placental histologic criteria for umbilical blood flow restriction in unexplained stillbirth. Hum Pathol 2008;39:948–953.

149. Sun Y, Arbuckle S, Hocking G, Billson V. Umbilical cord stricture and intrauterine fetal death. Pediatr Pathol Lab Med. 1995;15:723-732.

150. Blackwell S, Romero R, Chaiworapongsa T, Kim YM, Bujold E, et al. Maternal and fetal inflammatory responses in unexplained fetal death. J Matern Fetal Neonatal Med 2003;14:151-157.

151. Boog G. Chronic villitis of unknown etiology. Eur J Obstet Gynecol Reprod Biol 2008;136:9-15.

152. de Araujo MC, Schultz R, Vaz FA, Massad E, Feferbaum R, Ramos JL. A case-control study of histological chorioamnionitis and neonatal infection. Early Hum Dev 1994;40:51–58.

153. Gersell DJ. Chronic villitis, chronic chorioamnionitis, and maternal floor infarction. Semin Diagn Pathol 1993;10:251–266.

154. Lahra MM, Gordon A, Jeffrey HE. Chorioamnionitis and fetal response in stillbirth. Am J Obstet Gynecol 2007;196:229.e1-229.e4.

155. Naeye RL. Functionally important disorders of the placenta, umbilical cord and fetal membranes. Hum Pathol. 1987;18:680–691.

156. Pacora P, Chaiworapongsa T, Maymon E, et al. Funisitis and chorionic vasculitis: The histological counterpart of the fetal inflammatory response syndrome. J Matern Fetal Neonatal Med 2002;11:18–25.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

157. Redline RW, Faye-Petersen O, Heller D, et al., Amniotic infection syndrome: Nosology and reproducibility of placental reaction patterns. Pediatr Dev Pathol 2003;6:435–448.

158. Khong TY, De Wolf F, Robertson WB, Brosens I. Inadequate maternal vascular response to placentation in pregnancies complicated by pre-eclampsia and by small-for-gestational age infants. Br J Obstet Gynaecol 1986;93:1049–1059.

159. Kitzmiller JL, Watt N, Driscoll SG. Decidual arteriopathy in hypertension and diabetes in pregnancy: immunofluorescent studies. Am J Obstet Gynecol 1981;141:773–779.

160. Redline RW, Boyd T, Campbell V, et al. Maternal vascular underperfusion: Nosology and reproducibility of placental reaction patterns. Pediatr Dev Pathol 2004B;7:237–249.

161. Mandsager NT, Bendon RW, Mostello D, Rosenn B, Miodovnik M, Siddiqi TA. Maternal floor infarction of placenta: prenatal diagnosis and clinical significance. Obstet Gynecol 1994;83:750-754.

162. Andres RL, Kuyper W, Resnik R, Piacquadio KM, Benirschke K. The association of maternal floor infarction of the placenta with adverse perinatal outcome. Am J Obstet Gynecol 1990;163:935-938.

163. Naeye RL. Maternal floor infarction. Hum Pathol. 1985;16:823–828.

164. Shanklin DR, Scott JS. Massive subchorial thrombo-hematoma (Breus' mole). Br J Obstet Gynaecol. 1975;82:476–487.

165. Katzman PJ, Genest DR. Maternal floor infarction and massive perivillous fibrin deposition: histological definitions, association with intrauterine fetal growth restriction, and risk of recurrence. Pediatr Dev Pathol 2002;5:159-164.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

166. Fox H. Perivillous fibrin deposition in the human placenta. 1967;98:245-250.

167. Fuke Y, Aono T, Imai S, Suehara N, Fujita T, Nakayama M. Clinical significance and treatment of massive intervillous fibrin deposition associated with recurrent fetal growth retardation. Gynecol Obstet Invest. 1994;38:5-9.

168. Sebire NJ, Backos M, Goldin RD, Regan L. Placental massive perivillous fibrin deposition associated with antiphospholipid antibody syndrome. B J Obstet Gynaecol 2002;109:570-573.

169. Bane AL, Gillan JE. Massive perivillous fibrinoid causing recurrent placental failure. Br J Obstet Gynecol 2003;110:292-295.

170. Redline RW, Pappin A. Fetal thrombotic vasculopathy: the clinical significance of extensive avascular villi. Hum Pathol 1995;26:80-85.

171. McDonald DGM, Kelehan P, McMenamin JB. Placental Fetal Thrombotic Vasculopathy Is Associated With Neonatal Encephalopathy. Hum Pathol 2004;35:875-880.

172. Ariel I, Anteby E, Hamani Y, Redline RW. Placental pathology in fetal thrombophilia. Hum Pathol 2004;35:729–733.

173. Redline RW, Ariel I, Baergen RN, et al. Fetal vascular obstructive lesions: Nosology and reproducibility of placental reaction patterns. Pediatr Dev Pathol 2004A;7:443–452.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.

174. Becroft DM, Thompson JM, Mitchell EA. Placental infarcts, intervillous fibrin plaques, and intervillous thrombi: Incidences, co-occurrences, and epidemiological associations. Pediatr Dev Pathol 2004;7:26–34.

175. Kraus FT, Acheen VI. Fetal thrombotic vasculopathy in the placenta: cerebral thrombi and infarcts, coagulopathies, and cerebral palsy. Hum Pathol 1999;30:759-769.

176. Naeye RL, Maisels J, Lorenz RP, Botti JJ. The clinical significance of placental villous edema. Pediatrics 1983;71:588–594.

177. Shen-Schwarz S, Ruchelli E, Brown D. Villous edema of the placenta: a clinicopathological study. Placenta 1989;10:297–307.

Dudley DJ, Goldenberg R, Conway D, Silver RM, Saade GR, Varner MW, et al. A new system for determining the causes of stillbirth. Obstet Gynecol 2010;116.

The authors provided this information as a supplement to their article.