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Supplemental Table 1. Study Definitions by ICD-9-CM and ICD-10-CM Codes

Variable	ICD-9-CM	ICD-10-CM	Comment
Decompensation and Portal Hypertension Variables			
Decomp (decompensation event yes/no variable) Decomp_c (number of decompensation events)			Clinical decompensation defined as presence of any of these: varices with bleeding, hepatic encephalopathy, hepatorenal syndrome, hepatopulmonary syndrome, spontaneous bacterial peritonitis. Generally, it does not include non-bleeding varices or ascites; however, ascites *and* presence of portal hypertension or other chronic liver disease is counted as both a decompensation event and cirrhosis. Records showing a decompensation event were categorized as having cirrhosis. Biliary cirrhosis was counted as cirrhosis only when decompensation also occurred.
Esophageal varices, bleeding	456.0 456.20	I85.01	ICD-9 and 10 Code Descriptions 456.0 Esophageal varices with bleeding 456.20 Esophageal varices in diseases classified elsewhere, with bleeding I85.01 Esophageal varices with bleeding

Esophageal varices, no bleeding	456.1 456.21	I85.00	ICD-9 and 10 Code Descriptions 456.1 Esophageal varices without mention of bleeding 456.21 Esophageal varices in diseases classified elsewhere, without mention of bleeding I85.00 Esophageal varices without bleeding *Used to capture cirrhosis, but not a clinical decompensation event*
Hepatic encephalopathy	572.2		ICD-9 Code Descriptions 572.2 Hepatic encephalopathy
Hepatorenal syndrome	572.4	K76.7	ICD-9 and 10 Code Descriptions 572.4 Hepatorenal syndrome K76.7 Hepatorenal syndrome
Hepatopulmonary syndrome	573.5	K76.81	ICD-9 and 10 Code Descriptions 573.5 Hepatopulmonary syndrome K76.81 Hepatopulmonary syndrome
Spontaneous bacterial peritonitis	567.2	K65.2	ICD-9 and 10 Code Descriptions 567.2 Spontaneous bacterial peritonitis K65.2 Spontaneous bacterial peritonitis
Ascites	789.5	R18	ICD-9 and 10 Code Descriptions

		R18.8	789.5 Ascites
			R18 Ascites
			R18.8 Other ascites
Cirrhosis Variables			
Cirrhosis: Alcohol liver disease	571.2	K70.3 K70.3[01]	ICD-9 Code Descriptions 571.2 Alcoholic cirrhosis of liver ICD-10 Code Descriptions K70.3 Alcoholic cirrhosis of liver K70.3[01] Alcoholic cirrhosis of liver without/with ascites
Cirrhosis: Autoimmune	571.6	K74.3 K74.5	ICD-9 Code Descriptions 571.6 Biliary cirrhosis *[only coded as cirrhosis if record also shows a portal hypertensive decompensation event (including non-bleeding varices) or portal hypertension, otherwise it is coded as "other chronic liver disease without cirrhosis"]* ICD-10 Code Descriptions *The following group of codes are only coded as cirrhosis if record also shows a portal hypertensive decompensation event (including non-bleeding varices) or portal hypertension, otherwise it is coded as "other chronic liver disease without cirrhosis"*

			K74.3 Primary biliary cirrhosis, Chronic nonsuppurative destructive cholangitis K74.5 Biliary cirrhosis, unspecified
Cirrhosis: Other		K74.4	ICD-10 Code Descriptions K74.4 Secondary biliary cirrhosis *[only coded as cirrhosis if record also shows a portal hypertensive decompensation event (including non-bleeding varices) or portal hypertension, otherwise it is coded as "other chronic liver disease without cirrhosis"]*
Cirrhosis: Unknown	571.5 572.3 456.0 456.1 456.2[01] 572.2 572.4 573.5 567.2 789.5	K71.7 K72.1[01] K74.6 K74.6[09] K76.6 K65.2 K71.51 K72.9[01] K76.7 K76.81 I85.0 I85.0[01] R18	ICD-9 Code Descriptions 571.5 Cirrhosis of liver without mention of alcohol 572.3 Portal hypertension *[only coded as cirrhosis when accompanied by another chronic liver disease or cirrhosis code, or non-bleeding varices or any decompensation event] – unknown* 456.0 Esophageal varices with bleeding 456.1 Esophageal varices without mention of bleeding 456.20 Esophageal varices in diseases classified elsewhere, with bleeding 456.21 Esophageal varices in diseases classified elsewhere, without mention of bleeding

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		R18.8	572.2 Hepatic encephalopathy
			572.4 Hepatorenal syndrome
			573.5 Hepatopulmonary syndrome
			567.2 Spontaneous bacterial peritonitis
			789.5 Ascites *[only coded as cirrhosis when accompanied by another chronic liver disease or cirrhosis code (including portal hypertension)]*
			<u>ICD-10 Code Descriptions</u>
			K71.7 Toxic liver disease with fibrosis and cirrhosis of liver
			K72.10 Chronic hepatic failure without coma
			K72.11 Chronic hepatic failure with coma
			K74.6 Other and unspecified cirrhosis of liver
			K74.60 Unspecified cirrhosis of liver
			K74.69 Other cirrhosis of liver, including Cryptogenic, Macronodular, Micronodular, Mixed type, Portal, Post-necrotic
			K76.6 Portal hypertension *[only coded as cirrhosis when accompanied by another chronic liver disease or cirrhosis code, or non-bleeding varices or any decompensation event]* – *unknown*
			K65.2 Spontaneous bacterial peritonitis
			K71.51 Toxic liver disease with chronic active hepatitis with ascites

			K76.7 Hepatorenal syndrome
			K76.81 Hepatopulmonary syndrome
			I85.0 Esophageal varices
			I85.0[01] Esophageal varices without bleeding/with bleeding
			This next group of codes are used to define cirrhosis ONLY when accompanied by another chronic liver disease or cirrhosis code (including portal hypertension).
			K72.9 Hepatic failure, unspecified
			K72.90 Hepatic failure without coma
			K72.91 Hepatic failure with coma
			R18 Ascites
			R18.8 Other ascites
Decompensated cirrhosis			Indicator variable for cirrhosis and a clinical decompensation event. Non-bleeding varices does not count as a clinical decompensation event. - Yes if has a code for decompensation event - No if no code for decompensation event
Portal hypertension	572.3	K76.6	ICD-9 and 10 Code Descriptions 572.3 Portal hypertension K76.6 Portal hypertension

			Portal hypertension variable will take one of three values: 1 = Non-cirrhotic portal hypertension (has code for portal HTN alone, without code for cirrhosis or other specific chronic liver disease) 2 = Cirrhotic portal hypertension + cirrhosis (has code for portal HTN and code for cirrhosis or other specific chronic liver disease) 0 (may change to missing) = No code for portal HTN
Chronic Liver Disease Groups and Variables			
Chronic liver disease without cirrhosis: Autoimmune hepatitis	571.42	K75.4	ICD-9 Code Descriptions 571.42 Autoimmune hepatitis ICD-10 Code Descriptions K75.4 Autoimmune Hepatitis
Chronic liver disease without cirrhosis: Chronic viral hepatitis	571.4[019] 070.2[0123] 070.3[0123] 070.4[249] 070.5[249] 070.6 070.7[01] 070.9 V02.6[0129]	K71.3 K71.4 K71.5 K71.50 K73.[01289] K74.[012] B18.[01289] B19.[01] B19.1[01]	ICD-9 Code Descriptions 571.4 Chronic hepatitis 070.2x/070.3x Viral hepatitis B with/without hepatic coma 070.42 Hepatitis delta without mention of active hepatitis B disease with hepatic coma, Hepatitis delta with hepatitis B carrier state 070.44 Chronic hepatitis C with hepatic coma 070.49 Other specified viral hepatitis with hepatic coma

		B19.2	070.5 Other specified viral hepatitis without mention of hepatic coma
		B19.2[01]	
		B19.9	070.52 Hepatitis delta without mention of active hepatitis B disease or hepatic coma
		O98.41	
		O98.41[1239]	070.54 Chronic hepatitis C without mention of hepatic coma
		O98.42	070.59 Other specified viral hepatitis without mention of hepatic coma
		O98.43	
			070.6 Unspecified viral hepatitis with hepatic coma
			070.7 Unspecified viral hepatitis C
			070.70 Unspecified viral hepatitis C without hepatic coma, Unspecified viral hepatitis C NOS
			070.71 Unspecified viral hepatitis C with hepatic coma
			070.9 Unspecified viral hepatitis without mention of hepatic coma, Viral hepatitis NOS
			V02.6 Carrier or suspected carrier of viral hepatitis
			V02.60 Viral hepatitis carrier, unspecified
			V02.61 Hepatitis B carrier
			V02.62 Hepatitis C carrier
			V02.69 Other viral hepatitis carrier
			ICD-10 Code Descriptions
			K71.3 Toxic liver disease with chronic persistent hepatitis
			K71.4 Toxic liver disease with chronic lobular hepatitis

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			K71.5 Toxic liver disease with chronic active hepatitis K71.50 Toxic liver disease with chronic active hepatitis without ascites K73 Chronic hepatitis, not elsewhere classified K73.0 Chronic persistent hepatitis, not elsewhere classified K73.1 Chronic lobular hepatitis, not elsewhere classified K73.2 Chronic active hepatitis, not elsewhere classified K73.8 Other chronic hepatitis, not elsewhere classified K73.9 Chronic hepatitis, unspecified K74.0 Hepatic fibrosis K74.1 Hepatic sclerosis K74.2 Hepatic fibrosis with hepatic sclerosis B18.0/1 Chronic viral hepatitis B with/without delta-agent B18.2 Chronic viral hepatitis C B18.8 Other chronic viral hepatitis B18.9 Chronic viral hepatitis, unspecified B19 Unspecified viral hepatitis B19.0 Unspecified viral hepatitis with hepatic coma B19.1 Unspecified viral hepatitis B

			B19.10 Unspecified viral hepatitis B without hepatic coma, Unspecified viral hepatitis B NOS
			B19.11 Unspecified viral hepatitis B with hepatic coma
			B19.2 Unspecified viral hepatitis C
			B19.20 Unspecified viral hepatitis C without hepatic coma, Viral hepatitis C NOS
			B19.21 Unspecified viral hepatitis C with hepatic coma
			B19.9 Unspecified viral hepatitis without hepatic coma, Viral hepatitis NOS
			O98.4x Viral hepatitis complicating pregnancy, childbirth and the puerperium
Chronic liver disease without cirrhosis: Alcoholic liver disease	571.0 571.3	K70.0 K70.2 K70.4 K70.4[01] K70.9	ICD-9 Code Descriptions 571.0 Alcoholic fatty liver 571.3 Alcoholic liver damage, unspecified ICD-10 Code Descriptions K70.0 Alcoholic fatty liver K70.2 Alcoholic fibrosis and sclerosis of liver K70.4 Alcoholic hepatic failure K70.4[01] Alcoholic hepatic failure without/with coma

			K70.9 Alcoholic liver disease, unspecified
Chronic liver disease without cirrhosis: NAFLD/NASH	571.8	K76.0 K75.81	<u>ICD-9 Code Descriptions</u> 571.8 Other chronic nonalcoholic liver disease <u>ICD-10 Code Descriptions</u> K76.0 Fatty (change of) liver, not elsewhere classified, Nonalcoholic fatty liver disease (NAFLD) K75.81 Nonalcoholic steatohepatitis (NASH)
Chronic liver disease without cirrhosis: Autoimmune, aside from autoimmune hepatitis	571.6 576.1	K74.3 K74.5 K75.3 K75.8[9] K75.9 K83.0	<u>ICD-9 Code Descriptions</u> 571.6 Biliary cirrhosis *[counts as "other chronic liver disease without cirrhosis" if there is no portal hypertensive decompensation event (including non-bleeding varices) or portal hypertension associated with it]* 576.1 Cholangitis (captures primary sclerosing cholangitis) <u>ICD-10 Code Descriptions</u> *The following group of codes are coded as "other chronic liver disease without cirrhosis" if there is no portal hypertensive decompensation event (including non-bleeding varices) or portal hypertension associated with it.*

			K74.3 Primary biliary cirrhosis, Chronic nonsuppurative destructive cholangitis
			K74.5 Biliary cirrhosis, unspecified
			K75.3 Granulomatous hepatitis, not elsewhere classified
			K75.8 Other specified inflammatory liver diseases
			K75.89 Other specified inflammatory liver diseases
			K75.9 Inflammatory liver disease, unspecified
			K83.0 Cholangitis without liver abscess (captures primary sclerosing cholangitis)
Chronic liver disease without cirrhosis: Copper/Iron Metabolism Disorders	275.01 275.03 275.1	E83.01 E83.11 E83.11[0189]	ICD-9 Code Descriptions 275.01 Hereditary hemochromatosis 275.03 Other hemochromatosis 275.1 Disorders of copper metabolism (captures Wilson's disease) ICD-10 Code Descriptions E83.01 Wilson's disease E83.11 Hemochromatosis E83.110 Hereditary hemochromatosis: Bronzed diabetes, Pigmentary cirrhosis (of liver), Primary (hereditary) hemochromatosis

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			E83.111 Hemochromatosis due to repeated red blood cell transfusions: Iron overload due to repeated red blood cell transfusions, Transfusion (red blood cell) associated hemochromatosis E83.118 Other hemochromatosis E83.119 Hemochromatosis, unspecified
Chronic liver disease without cirrhosis: Other	571.9 573.9 573.0 273.4 453.0	K76.8 K76.9 K77 K74.4 E88.01 I82.0 K76.1 K76.4 K76.5 K76.8 K76.9	ICD-9 Code Descriptions 571.9 Unspecified chronic liver disease without mention of alcohol 573.9 Unspecified disorder of liver 573.0 Chronic passive congestion of liver 273.4 Alpha 1 antitrypsin deficiency 453.0 Budd-Chiari syndrome ICD-10 Code Descriptions K76.8 Other specified diseases of liver K76.9 Liver disease, unspecified K77 Liver disorders in diseases classified elsewhere K74.4 Secondary biliary cirrhosis E88.01 Alpha 1 antitrypsin deficiency I82.0 Budd-Chiari syndrome

			K76.1 Chronic passive congestion of liver, Cardiac cirrhosis Cardiac sclerosis
			K76.4 Peliosis hepatis, Hepatic angiomatosis – other
			K76.5 Hepatic veno-occlusive disease

Exclusions

Acute Liver Diseases	573.1	K71.0	Excluded from analysis, unless a concomitant chronic liver
	573.2	K71.1[01]	disease or cirrhosis existed, then included with Cirrhosis group
	573.3	K71.2	or Chronic Liver Disease without Cirrhosis group.
	070.0	K71.6	
	070.1	K71.8	ICD-9 Code Descriptions
	070.41	K71.9	573.1 Hepatitis in viral diseases classified elsewhere
	070.43	K75.2	[Coxsackie virus disease (074.8), cytomegalic inclusion virus
	070.51	B15	disease (078.5), infectious mononucleosis (075), but does not
	070.53	B15.0	include hepatitis (in): mumps (072.71), viral (070.0-070.9),
		B15.9	yellow fever (060.0-060.9)]
		B16	573.2 Hepatitis in other infectious diseases classified
		B16.0	elsewhere
		B16.1	[Does not include hepatitis in: late syphilis (095.3), secondary
		B16.2	syphilis (091.62), toxoplasmosis (130.5)]
		B16.9	573.3 Hepatitis, unspecified; Toxic (noninfectious) hepatitis
		B17	
		B17.0	070.0, 070.1 Viral hepatitis A with/without mention of hepatic
		B17.1	coma

		B17.1[01]	070.41 Acute hepatitis C with hepatic coma
		B17.2	070.43 Hepatitis E with hepatic coma
		B17.8	070.51 Acute hepatitis C without mention of hepatic coma
		B17.9	070.53 Hepatitis E without mention of hepatic coma
			ICD-10 Code Descriptions
			K71.0 Toxic liver disease with cholestasis; Cholestasis with hepatocyte injury; 'Pure' cholestasis
			K71.1 Toxic liver disease with hepatic necrosis
			K71.10 Toxic liver disease with hepatic necrosis, without coma
			K71.11 Toxic liver disease with hepatic necrosis, with coma
			K71.2 Toxic liver disease with acute hepatitis
			K71.6 Toxic liver disease with hepatitis, not elsewhere classified
			K71.8 Toxic liver disease with other disorders of liver
			K71.9 Toxic liver disease, unspecified
			K72.0 Acute and subacute hepatic failure
			K72.00 Acute and subacute hepatic failure without coma
			K72.01 Acute and subacute hepatic failure with coma
			K75.2 Nonspecific reactive hepatitis
			B15 Acute hepatitis A

			B15.0 Hepatitis A with hepatic coma
			B15.9 Hepatitis A without hepatic coma; Hepatitis A (acute)(viral) NOS
			B16 Acute hepatitis B
			B16.0 Acute hepatitis B with delta-agent with hepatic coma
			B16.1 Acute hepatitis B with delta-agent without hepatic coma
			B16.2 Acute hepatitis B without delta-agent with hepatic coma
			B16.9 Acute hepatitis B without delta-agent and without hepatic coma; Hepatitis B (acute) (viral) NOS
			B17 Other acute viral hepatitis
			B17.0 Acute delta-(super) infection of hepatitis B carrier
			B17.1 Acute hepatitis C
			B17.10 Acute hepatitis C without hepatic coma; Acute hepatitis C NOS
			B17.11 Acute hepatitis C with hepatic coma
			B17.2 Acute hepatitis E
			B17.8 Other specified acute viral hepatitis; Hepatitis non-A non-B (acute) (viral) NEC
			B17.9 Acute viral hepatitis, unspecified; Acute hepatitis NOS
Prior Liver Transplant	996.82 V42.7	T86.4[01239] Z48.23	ICD-9 Code Descriptions

		Z94.4	996.82 Complications of transplanted organ; Transplant failure or rejection: Liver
			V42.7 Organ or tissue replaced by transplant: Liver
			ICD-10 Code Descriptions
			T86.4 Complications of liver transplant
			T86.40 Unspecified complication of liver transplant
			T86.41 Liver transplant rejection
			T86.42 Liver transplant failure
			T86.43 Liver transplant infection
			Use additional code to identify infection, such as:
			Cytomegalovirus (CMV) infection (B25.-)
			T86.49 Other complications of liver transplant
			Z48.23 Encounter for aftercare following liver transplant
			Z94.4 Liver transplant status
Pregnancy Codes			
Pregnancy Definitions			Discharge codes and Procedure Codes were considered for identifying pregnancy records. To avoid counting multiple records for the same pregnancy, codes that indicated an end of pregnancy event were searched. Non-natural causes of termination events were excluded from analysis, as were miscarriages and spontaneous or missed abortions.

Pregnancy Inclusion Codes	Discharge Codes	Discharge Codes	Discharge Codes
	632	O60.10X[0123459]	Preterm labor with preterm delivery
	634.[0-9][012]	O60.12X[0123459]	Term delivery with preterm labor
	640.[09]1	O60.13X[0123459]	Outcome of delivery indicator
	641.[012389]1	O60.14X[0123459]	
	642.[012345679][12]	O60.2	O80 Encounter for full-term uncomplicated delivery
		O60.20	Delivery requiring minimal or no assistance, with or without
	643.[01289]1	O60.20X[0123459]	episiotomy, without fetal manipulation [e.g., rotation version] or
	644.21	O60.22	instrumentation [forceps] of a spontaneous, cephalic, vaginal,
	645.[12]1	O60.22X[0123459]	full-term, single, live-born infant. This code is for use as a
	646.[0123456789]1	O60.23	single diagnosis code and is not to be used with any other
	646.[124568]2	O60.23X[0123459]	code from chapter 15.
	647.[012345689][12]	O80	Use additional code to indicate outcome of delivery (Z37.0)
		O82 (these two should be superfluous when Z37 is accounted for)	
	648.[0123456789][12]		O82 Encounter for cesarean delivery without indication
			Use additional code to indicate outcome of delivery (Z37.0)
	649.[012345678]1		
	649.[0123468]2		Procedure Codes
	650	Z37	Low/Mid/High forceps operation, Outlet forceps operation
	651.[0123456789]1	Z37.[012345679]	Forceps rotation of fetal head: DeLee maneuver, Key-in-lock
	652.[0123456789]1	Z37.5[012349]	rotation, Kielland rotation, Scanzoni's maneuver;
	653.[0123456789]1	Z37.6[012349]	Breech extraction
	654.[0123456789]1		Partial breech extraction with forceps to aftercoming head
	654.[013456789]2	Procedure Codes	Other partial breech extraction

	655.[0123456789]1	0W8NXZZ	Total breech extraction with forceps to aftercoming head
	656.[012356789]1	10D00Z[012]	Other total breech extraction
	656.4[013]	10D07Z[34568]	Forceps application to aftercoming head, Piper forceps
	657.01	10S07ZZ	operation.
	658.[0123489]1		Vacuum extraction
	659.[0123456789]1		Other instrumental delivery
	660.[0123456789]1		Cesarean section
	661.[012349]1		Other cesarean section of unspecified type: Cesarean section
	662.[0123]1		NOS, Obstetrical abdominouterotomy, Obstetrical hysterotomy
	663.[012345689]1		
	664.[012345689]1		
	665.[013456789]1		
	665.[2789]2		
	666.[0123]2		
	667.[01]2		
	668.[01289][12]		
	669.[012456789]1		
	669.[0123489]2		
	670.[01238]2		
	671.[0123589]1		
	671.[0124589]2		
	672.02		
	673.[01238]1		
	673.[01238]2		

	674.[05]1 674.[01234589]2 675.[01289]1 675.[01289]2 676.[012345689]1 676.[012345689]2 678.[01]1 679.[01]1 679.[01]2 V27.[012345679] Procedure Codes 72.[0123456789] 72.2[19] 72.3[19] 72.5[1234] 72.7[19] 74.[01249] 74.99		
Pregnancy Exclusion Codes	Discharge Codes Pregnant with non-natural termination: 630	Discharge Codes Pregnant with non-natural termination: O00	Discharge Codes Ectopic pregnancy Hydatidiform mole Other abnormal products of conception

	631	O00.[01289]	(Induced) termination of pregnancy
	631.[08]	O01	Failed attempted termination of pregnancy
	633	O01.[019]	Miscarriage or spontaneous/missed abortion
	633.0	O02	
	633.0[01]	O02[.089]	Procedure Codes
	633.1	O02.8	Dilation and curettage for termination of pregnancy
	633.1[01]	O02.8[19]	Aspiration curettage of uterus for termination of pregnancy,
	633.2	O02.9	Therapeutic abortion NOS
	633.2[01]	O04.8	Removal of extratubal ectopic pregnancy
	633.8	O04.8[09]	Hysterotomy to terminate pregnancy, Therapeutic abortion by
	633.8[01]	O07	hysterotomy
	633.9		Intra-amniotic injection for abortion
	633.9[01]	Miscarriage or	
	635.[012345679][012]	spontaneous/missed	
		abortion:	
	636.[012345679][012]	O02.1	
		O03	
	637.[012345679][012]	O03.[012]	
		O03.3	
	638	O03.3[0123456789]	
	638.[0123456789]	O03.[45678]	
		O03.8[0123456789]	
		O03.9	

| | Miscarriage or spontaneous/missed abortion: 634.[0123456789][012]

<u>Procedure Codes</u> Non-naturally terminated 69.01 69.51 74.3 74.91 75.0 | <u>Procedure Codes</u> Non-naturally terminated 10A0[034]ZZ 10A07Z6 10A07ZX 10A07ZZ 10A08ZZ 10T2[034]ZZ | |
|---|---|---|---|
| **Study Outcomes** | | | |
| Hypertensive complication (pre-eclampsia, eclampsia, or HELLP syndrome) | 642.4x 642.7x 642.5x 642.6x | O14.00 O14.90 O14.0[23] O14.9[23] O15.2 O11.9 O11.[123] O15.2 O14.10 | Mild or unspecified pre-eclampsia Mild to moderate pre-eclampsia, unspecified trimester Unspecified pre-eclampsia, unspecified trimester Mild to moderate pre-eclampsia, [second/third] trimester Unspecified pre-eclampsia, [second/third] trimester Eclampsia in the puerperium

 Pre-eclampsia or eclampsia superimposed on pre-existing hypertension |

		O14.20	Pre-existing hypertension with pre-eclampsia, unspecified trimester
		O14.1[23]	
		O14.2[23]	Pre-existing hypertension with pre-eclampsia, [first/second/third] trimester
		O15.00	
		O15.9	Eclampsia in the puerperium
		O15.0[23]	
		O15.1	Severe pre-eclampsia/HELLP
		O15.2	Severe pre-eclampsia, unspecified trimester
			HELLP syndrome (HELLP), unspecified trimester
			Severe pre-eclampsia, [second/third] trimester
			HELLP syndrome (HELLP), [second/third] trimester
			Eclampsia
			Eclampsia in pregnancy, unspecified trimester
			Eclampsia, unspecified as to time period
			Eclampsia in pregnancy, [second/third] trimester
			Eclampsia in labor
			Eclampsia in the puerperium
Postpartum hemorrhage	666.0[024] 666.1[024] 666.2[024] 666.3[024]	O72.[0123]	
Pre-term birth (<37 weeks)	644.20 644.21	O60.10xx[0123459] O60.12xx[0123459]	Codes (644.20, 644.21) each include:

		O60.13xx[0123459] O60.14xx[0123459]	Onset (spontaneous) of delivery before 37 completed weeks of gestation
			Premature labor with onset of delivery before 37 completed weeks of gestation
			Preterm labor with preterm delivery
Fetal growth restriction	656.5[013]	O36.59[1239]	
Large for gestational age	653.5[013] 656.6[013]	O36.60X[0123459] O36.61X[0123459] O36.62X[0123459] O36.63X[0123459]	
Fetal death	656.4[013]	V27.1 V27.3 V27.4 V27.6 V27.7 Z37.1 Z37.3 Z37.4 Z37.6[012349] Z37.7 O36.4XX[0123459]	Stillborn (at least one, if multiple gestation) Fetal death: NOS, after completion of 22 weeks' gestation, late, Missed delivery

Additional Variables			
Diabetes, pre-existing	without chronic complications: 249.00-249.31 250.00-250.33 648.00-648.04 with chronic complications: 249.40-249.91 250.40-250.93	without chronic complications: E08.xx E09.xx E10.xx E11.xx E13.xx O24.[01389]xx with chronic complications: E08.[234568]xxx E09.[234568]xxx E10.[234568]xxx E11.[234568]xxx E13.[234568]xxx	ICD-9 Codes based on this source, with minor modification to remove codes specifically for fetal records: https://www.hcup-us.ahrq.gov/toolssoftware/comorbidity/Table2-FY12-V3_7.pdf ICD-10 Codes based on this source, with minor modification to remove codes specifically for fetal records: https://www.hcup-us.ahrq.gov/toolssoftware/comorbidityicd10/comformat_icd10cm_2019_1.txt
Hypertension, pre-existing	401.0 401.1 401.9 405 405.0 405.0[19] 405.1[19]	I10. I15.0 I15.1 I15.2 I15.8 I15.9 O10.01[1239]	ICD-9 Code Descriptions 401 Essential hypertension: Malignant, Benign, Unspecified 405 Secondary hypertension: Malignant (Renovascular, Other), Benign (Renovascular, Other), Unspecified (Renovascular, Other) 642.0 Benign essential hypertension complicating pregnancy, childbirth, and the puerperium

	405.9	O10.02	642.1 Hypertension secondary to renal disease, complicating pregnancy, childbirth, and the puerperium
	405.9[19]	O10.03	642.2 Other pre-existing hypertension complicating pregnancy, childbirth, and the puerperium
	642.0[0-4]	O10.41[1239]	
	642.1[0-4]	O10.42	642.7 Pre-eclampsia or eclampsia superimposed on pre-existing hypertension
	642.2[0-4]	O10.43	
	642.7[0-4]	O10.91[1239]	642.9 Unspecified hypertension complicating pregnancy, childbirth, or the puerperium
	642.9[0-4]	O10.92	
		O10.93	
		O11.9	ICD-10 Code Descriptions
		O11.1	Essential (primary) hypertension
		O11.2	Pre-existing essential hypertension complicating pregnancy or childbirth or puerperium
		O11.3	Unspecified pre-existing hypertension complicating pregnancy or childbirth or puerperium
			Renovascular hypertension
			Hypertension secondary to other renal disorders
			Pre-existing secondary hypertension complicating pregnancy or childbirth or puerperium
			Pre-existing hypertension with pre-eclampsia
			Hypertension secondary to endocrine disorders
			Other secondary hypertension
			Secondary hypertension, unspecified

Dyslipidemia, pre-existing	272.0	E78.0	Pure hypercholesterolemia
	272.1	E78.1	Pure hyperglyceridemia
	272.2	E78.2	Mixed hyperlipidemia
	272.4	E78.4	Other hyperlipidemia
		E78.5	Hyperlipidemia, unspecified
Obesity, pre-existing	278.01	E66.0[19]	Morbid (severe) obesity due to excess calories
	278.00	E66.[1289]	Other obesity due to excess calories
	278.03	O99.21[012345]	Drug-induced obesity
	649.1[01234]	R93.9	Morbid (severe) obesity with alveolar hypoventilation
	793.91	Z68.3[0123456789]	Other obesity
	V85.3[0123456789]	Z68.4[12345]	Obesity, unspecified
	V85.4[12345]	Z68.54	Obesity complicating pregnancy
	V85.54		Obesity complicating childbirth
			Obesity complicating the puerperium
			Diagnostic imaging inconclusive due to excess body fat of patient
			Body mass index (BMI) 30.0 or greater, adult
			Body mass index (BMI) pediatric, greater than or equal to 95th percentile for age
Multiple gestation	V27.2	Z37.2	Twins, both liveborn
	V27.3	Z37.3	Twins, one liveborn and one stillborn
	V27.4	Z37.4	Twins, both stillborn
	V27.5	Z37.50	Multiple births, unspecified, all liveborn
	V27.6	Z37.5[12349]	

	V27.7	Z37.6[012349] Z37.7	Triplets/Quadruplets/Quintuplets/Sextuplets/Other multiple births, all liveborn Triplets/Quadruplets/Quintuplets/Sextuplets/Other multiple births, some liveborn Other multiple births, all stillborn
Gestational diabetes mellitus	648.8[01234]	O99.81[045] O24.4 O24.41 O24.41[049] O24.42 O24.42[049] O24.43 O24.43[049]	Abnormal glucose tolerance; Includes Gestational diabetes Abnormal glucose complicating pregnancy, childbirth and the puerperium
Mode of delivery: Cesarean section* Vaginal birth	765 766 [767/768, 774/775]	783 784 785 786 787 788 [768, 796, 797, 798, 805, 806, 807]	ICD-9 DRG Codes, V34, https://www.cms.gov/icd10manual/version34-fullcode-cms/fullcode_cms/P0372.html CESAREAN SECTION WITH/WITHOUT CC/MCC [VAGINAL DELIVERY WITH STERILIZATION AND/OR D&C, VAGINAL DELIVERY WITH O.R. PROCEDURE EXCEPT STERILIZATION AND/OR D&C, VAGINAL DELIVERY WITH/WITHOUT COMPLICATING DIAGNOSES]

			ICD-10 DRG Codes, V36 (2019), https://www.cms.gov/ICD10Manual/version36-fullcode-cms/fullcode_cms/P0370.html CESAREAN SECTION WITH/WITHOUT STERILIZATION WITH/WITHOUT CC/MCC [VAGINAL DELIVERY WITH O.R. PROC EXCEPT STERIL &/OR D&C VAGINAL DELIVERY WITH STERILIZATION/D&C WITH/WITHOUT CC/MCC VAGINAL DELIVERY WITHOUT STERILIZATION/D&C WITH/WITHOUT CC/MCC]

*DRG = Diagnosis Related Group. DRGs comprise a patient classification system that categorizes patients into groups that are clinically coherent and homogeneous with respect to resource use. DRGs group patients according to diagnosis, type of treatment (procedures), age, and other relevant criteria. Each hospital stay has one DRG assigned to it. Reference: Wier LM, Witt E, Burgess J EA. Hospitalizations related to diabetes in pregnancy, 2008: Statistical brief #102. In: Healthcare Cost and Utilization Project (HCUP) Statistical Briefs. Rockville, MD: Agency for Healthcare Research and Quality; 2010.

Supplemental Table 2. AIH and Maternal and Perinatal Outcomes by Race: Adjusted Analyses

	AIH vs Other CLD		AIH vs no CLD	
	AOR*, 95% CI	p value	AOR*, 95% CI	p value
Maternal Outcomes (reference group: White)				
Gestational DM				
Black	**1.20 (1.01-1.41)**	**0.04**	**0.93 (0.91-0.95)**	**<0.001**
Hispanic	**1.94 (1.63-2.30)**	**<0.001**	**1.52 (1.49-1.55)**	**<0.001**
Gestational HTN				
Black	1.09 (0.87-1.36)	0.44	1.01 (0.99-1.03)	0.46
Hispanic	0.82 (0.63-1.07)	0.14	**0.63 (0.61-0.64)**	**<0.001**
Hypertensive complications (pre-eclampsia, eclampsia, and/or HELLP syndrome)				
Black	**1.38 (1.13-1.68)**	**0.002**	**1.35 (1.32-1.38)**	**<.001**
Hispanic	**1.60 (1.32-1.96)**	**<0.001**	**1.04 (1.01-1.06)**	**0.002**
Cesarean section				
Black	0.93 (0.85-1.02)	0.15	**1.20 (1.19-1.21)**	**<0.001**
Hispanic	0.97 (0.87-1.07)	0.55	**1.07 (1.05-1.08)**	**<0.001**
Postpartum hemorrhage				
Black	0.73 (0.32-1.65)	0.44	1.15 (0.51-2.62)	0.73
Hispanic				
Maternal death	**		**	
Perinatal Outcomes (reference group: White)				
Pre-term birth (<37 weeks)				
Black	0.98 (0.82-1.16)	0.79	**1.53 (1.48-1.57)**	**<0.001**
Hispanic	1.04 (0.85-1.26)	0.71	**1.13 (1.09-1.16)**	**<0.001**
Fetal growth restriction				
Black	**0.67 (0.51-0.87)**	**0.003**	1.41 (1.37-1.46)	<0.001
Hispanic	**0.47 (0.32-0.69)**	**<0.001**	0.71 (0.69-0.74)	<0.001
Large for gestational age				
Black	0.87 (0.62-1.21)	0.40	**0.53 (0.52-0.55)**	**<0.001**
Hispanic	1.14 (0.82-1.58)	0.45	**0.78 (0.76-0.80)**	**<0.001**
Fetal death	**		**	

Abbreviations: autoimmune hepatitis (AIH), chronic liver disease (CLD), diabetes mellitus (DM), hypertension (HTN), hemolysis, elevated liver tests, low platelets (HELLP)

*Adjusted for age, multiple gestation, obesity, pre-existing HTN, pre-existing DM, pre-existing hyperlipidemia, and cirrhosis (when comparing AIH to other CLD)

** Insufficient outcomes to determine OR