

MICHIGAN DEPARTMENT OF HEALTH AND HUMAN SERVICES

CERTIFICATE OF NEED (CON) REVIEW STANDARDS FOR OPEN HEART SURGERY (OHS) SERVICES

(By the authority conferred on the CON Commission by Section 22215 of Act No. 368 of the Public Acts of 1978, as amended, and sections 7 and 8 of Act No. 306 of the Public Acts of 1969, as amended, being sections 333.22215, 24.207, and 24.208 of the Michigan Compiled Laws.)

Section 1. Applicability

Sec. 1. (1) These standards are requirements for approval of the initiation or acquisition of OHS services, and delivery of these services under Part 222 of the Code. Pursuant to Part 222 of the Code, OHS is a covered clinical service. The Department shall use these standards in applying Section 22225(1) of the Code, being Section 333.22225(1) of the Michigan Compiled Laws and Section 22225(2)(c) of the Code, being Section 333.22225(2)(c) of the Michigan Compiled Laws.

Section 2. Definitions

Sec. 2. (1) For purposes of these standards:

- (a) "Adult OHS" means OHS offered and provided to individuals age 15 and older as defined in subsection (i).
- (b) "Cardiac surgical team" means the designated specialists and support personnel who consistently work together in the performance of OHS.
- (c) "Certificate of Need Commission" or "Commission" means the Commission created pursuant to Section 22211 of the Code, being Section 333.22211 of the Michigan Compiled Laws.
- (d) "Code" means Act No. 368 of the Public Acts of 1978, as amended, being Section 333.1101 et seq. of the Michigan Compiled Laws.
- (e) "Department" means the Michigan Department of Health and Human Services (MDHHS).
- (f) "Hospital" means a health facility licensed under Part 215 of the Code.
- (g) "Medicaid" means title XIX of the social security act, chapter 531, 49 Stat. 620, 42 U.S.C. 1396 to 1396g and 1396i to 1396u.
- (h) "Michigan inpatient data base" or "MIDB" means the data base compiled by the Michigan Health and Hospital Association or successor organization. The data base consists of inpatient discharge records from all Michigan hospitals and Michigan residents discharged from hospitals in border states for a specific calendar year.
- (i) "Open heart surgery" means any cardiac surgical procedure involving the heart and/or thoracic great vessels (excluding organ transplantation) that is intended to correct congenital and acquired cardiac and coronary artery disease and/or great vessels and often uses a heart-lung pump (pumps and oxygenates the blood) or its equivalent to perform the functions of circulation during surgery. These procedures may be performed off-pump (beating heart), although a heart-lung pump is still available during the procedure.
- (j) "Open heart surgical case" means a single visit to an operating room during which one or more OHS procedures are performed. The list of OHS procedures shall be maintained by the Department.
- (k) "OHS service" means a hospital program that is staffed with surgical teams and other support staff for the performance of open heart surgical procedures. An OHS service performs OHS procedures on an emergent, urgent and scheduled basis.
- (l) "Pediatric OHS" means OHS offered and provided to infants and children age 14 and younger, and to other individuals with congenital heart disease as defined by the ICD-9-CM codes of 745.0 through 747.99 (See Appendix C for ICD-10-CM Codes).
- (m) "Planning area" means the groups of counties shown in Section 11.

(2) The definitions in Part 222 shall apply to these standards.

Section 3. Requirements to initiate OHS services

Sec. 3. (1) An applicant proposing to initiate either adult or pediatric OHS as a new service shall be a hospital and operating or approved to operate a diagnostic and therapeutic adult or pediatric cardiac catheterization service, respectively.

(2) A hospital proposing to initiate OHS as a new service shall have a written consulting agreement with a hospital which has an existing active OHS service performing a minimum of 400 open heart surgical cases per year for 3 consecutive years. The agreement must specify that the existing service shall, for the first 3 years of operation of the new service, provide the following services to the applicant hospital:

(a) Receive and make recommendations on the proposed design of surgical and support areas that may be required;

(b) Provide staff training recommendations for all personnel associated with the new proposed service;

(c) Provide recommendations on staffing needs for the proposed service; and

(d) Work with the medical staff and governing body to design and implement a process that will annually measure, evaluate, and report to the medical staff and governing body the clinical outcomes of the new service, including: (i) Mortality rates, (ii) Complication rates, (iii) Success rates, and (iv) Infection rates.

(3) An applicant proposing to initiate adult OHS as a new service shall demonstrate 300 adult open heart surgical cases based on the methodology set forth in Section 9.

(4) An applicant proposing to initiate pediatric OHS as a new service shall demonstrate 100 pediatric open heart surgical cases based on the methodology set forth in Section 10.

Section 4. Requirements to replace an existing OHS service

Sec. 4. Replace an existing adult or pediatric OHS service means relocating an existing adult or pediatric OHS service to a new geographic location of an existing licensed hospital. The term does not include the replacement of an existing OHS service at the same site. An applicant requesting to replace an existing OHS service shall demonstrate each of the following, as applicable to the proposed project.

(1) An applicant proposing to replace an existing OHS service shall demonstrate the following:

(a) The existing OHS service to be replaced has been in operation for at least 36 months as of the date an application is submitted to the Department.

(b) The proposed new site is a hospital that is owned by, is under common control of, or has a common parent as the applicant hospital.

(c) The applicant is simultaneously replacing its OHS service and its cardiac catheterization service to the proposed new site.

(d) The proposed new site is within the same planning area of the site at which the existing OHS service is located and within 5 miles of the existing OHS service location if located in a metropolitan statistical area county, or within 10 miles of the existing OHS service location if located in a rural or micropolitan statistical area county.

(e) The existing OHS service to be relocated performed at least the applicable minimum number of open heart surgical cases set forth in Section 8 as of the date an application is deemed submitted by the Department unless the OHS service being replaced is part of the replacement of the entire hospital to a new geographic site.

(f) The cardiac catheterization and OHS services shall cease operation at the original site prior to beginning operation at the new site.

Section 5. Requirements to acquire an existing open heart surgery service

Sec. 5. An applicant proposing to acquire a hospital that has been approved to perform OHS services may also acquire the existing OHS service if it can demonstrate that the proposed project meets all of the following:

(1) An application for the first acquisition of an existing OHS service after February 25, 2008 shall not be required to be in compliance with the applicable volume requirements on the date of acquisition. The OHS service shall be operating at the applicable volume requirements set forth in Section 8 of these standards in the second 12 months after the date the service is acquired, and annually thereafter.

(2) Except as provided for in subsection (1), an application for the acquisition of an existing OHS service after February 25, 2008 shall be required to be in compliance with the applicable volume requirements, as set forth in the project delivery requirements, on the date an application is submitted to the Department.

(3) The applicant agrees to operate the OHS service in accordance with all applicable project delivery requirements set forth in Section 8 of these standards.

Section 6. Requirements for Medicaid participation

Sec. 6. An applicant shall provide verification of Medicaid participation. An applicant that is a new provider not currently enrolled in Medicaid shall certify that proof of Medicaid participation will be provided to the Department within six (6) months from the offering of services if a CON is approved.

Section 7. Requirements for MIDB data commitments

Sec. 7. In order to use MIDB data in support of an application for either adult or pediatric OHS services, an applicant shall demonstrate or agree, as applicable, to all of the following:

(1) A hospital(s) whose adult MIDB data is used in support of a CON application for adult OHS services shall not use any of its adult MIDB data in support of any other application for adult OHS services prior to 7 years after the initiation of the OHS service for which MIDB data were used to support. After the 7-year period, a hospital(s) may only commit its adult MIDB data in support of another application for adult OHS services if they have experienced an increase from the previously committed MIDB data. Only that additional increase in MIDB data can be committed to another applicant to initiate OHS services.

(2) A hospital(s) whose pediatric MIDB data is used in support of a CON application for pediatric OHS services shall not use any of its pediatric MIDB data in support of any other application for pediatric OHS services prior to 7 years after the initiation of the OHS service for which MIDB data were used to support. After the 7-year period, a hospital(s) may only commit its pediatric MIDB data in support of another application for pediatric OHS services if they have experienced an increase from the previously committed MIDB data. Only that additional increase in MIDB data can be committed to another applicant to initiate OHS services.

(3) The hospital(s) committing MIDB data does not currently operate an adult or pediatric OHS service or have a valid CON issued under Part 222 to operate an adult or pediatric OHS service.

(4) The hospital(s) committing MIDB data is located in the same planning area as the hospital to which MIDB data is being proposed to be committed.

(5) The hospital(s) committing MIDB data to a CON application has completed the departmental form(s) which (i) authorizes the Department to verify the MIDB data, (ii) agrees to pay all charges associated with verifying the MIDB data, and (iii) acknowledges and agrees that the commitment of the MIDB data is for the period of time specified in subsection (1) or (2), as applicable.

(6) The hospital(s) committing MIDB data to an application is regularly admitting patients as of the date the Director makes the final decision on that application, under Section 22231 of the Code, being Section 333.22231 of the Michigan Compiled Laws.

Section 8. Project delivery requirements and terms of approval for all applicants

Sec. 8. An applicant shall agree that, if approved, the OHS services shall be delivered in compliance with the following terms of CON approval:

(1) Compliance with these standards.

(2) Compliance with the following quality assurance standards:

(a) Each physician credentialed by the hospital to perform adult OHS cases, as the attending surgeon, shall perform a minimum of 50 adult OHS cases per year. The annual case load for a physician means adult OHS cases performed by that physician, as the attending surgeon, in any hospital or combination of hospitals.

(b) The service shall have the cardiac surgical team available on call for emergency cases 24 hours a day, 7 days a week.

(c) The applicant hospital shall participate with the Society of Thoracic Surgeons (STS) National Database and the Michigan Society of Thoracic and Cardiovascular Surgeons (MSTCVS) Quality Collaborative and Database or a designee of the Department that monitors quality and risk adjusted outcomes.

(3) Compliance with the following access to care requirements:

(a) The service shall accept referrals for OHS from all appropriately licensed practitioners.

(b) The applicant hospital shall participate in Medicaid at least 12 consecutive months within the first two years of operation and annually thereafter.

(c) The applicant hospital shall not deny OHS services to any individual based on the ability to pay or source of payment.

Compliance with selective contracting requirements shall not be construed as a violation of this term.

(d) The operation of and referral of patients to the OHS services shall be in conformance with 1978 PA 368, Sec. 16221, as amended by 1986 PA 319; MCL 333.1621; MSA 14.15 (16221).

(4) Compliance with the following monitoring and reporting requirements:

(a) The OHS service shall be operating at an annual level of 150 adult open heart surgical cases or 100 pediatric open heart surgical cases, as applicable, as submitted to the STS Database, by the end of the third 12 full months of operation, and annually thereafter.

(b) The applicant hospital shall prepare and present to the medical staff and governing body reports describing activities in the OHS service including complication rates and other morbidity and mortality data.

(c) The applicant hospital shall participate in a data collection network established and administered by the Department or its designee. The data may include but is not limited to annual budget and cost information, operating schedules, patient demographics, diagnostic, morbidity and mortality information, and the volume of care provided to patients from all payor sources. The applicant hospital shall provide the required data in a format established by the Department and in a mutually agreed upon media. The Department may elect to verify the data through on-site review of appropriate records.

(d) The applicant hospital shall participate in a data registry administered by the Department or its designee as a means to measure quality and risk adjusted outcomes within OHS programs. The

Department shall use all composites in the STS Composite Star Rating System, including but not limited to: coronary artery bypass graft composite (CABG), aortic valve replacement (AVR), and the multiprocedural composite measure. The Department or its designee shall require that the applicant hospital submit a summary report as specified by the Department. The applicant hospital shall provide the required data in a format established by the Department or its designee. The applicant hospital shall be liable for the cost of data submission and on-site reviews in order for the Department to verify and monitor volumes and assure quality. The applicant hospital shall become a member of the data registry specified by the Department upon initiation of the service and continue to participate annually thereafter for the life of that service. The outcomes database must undergo statewide auditing.

(e) The applicant hospital shall utilize and report the STS Composite Star Rating System for all procedures as follows:

(i) If the program does not qualify to receive a star rating in one or more composite metrics but receives a two-star or higher rating in at least one composite metric for the same time period, the program shall be considered in compliance.

(ii) If the program receives a one-star rating in any composite metric, they shall submit a report to the Department explaining the reason(s) for the unsatisfactory rating.

(iii) If the program receives two one-star ratings in a row in the same composite metric, they shall submit an action plan to the Department detailing specific actions to rectify the program deficiencies.

(iv) If the program receives two one-star ratings within the same composite metric, the program may have two years to obtain a minimum two-star rating within that composite metric. Upon receipt of a two-star or higher rating, the program shall be considered in compliance.

(f) If the program participates in the STS composite star rating system and does not receive a star rating for any reason, they shall submit a report to the department explaining the reason(s) for not receiving a star rating.

(g) The applicant hospital shall provide the Department with timely notice of the proposed project implementation consistent with applicable statute and promulgated rules.

(h) The applicant shall provide notice to the Department of any planned decrease or discontinuation of service(s) no later than 30 days after the planned decrease or discontinuation of the service(s).

(5) Nothing in this section prohibits the Department from taking compliance action under MCL 333.22247.

(6) The agreements and assurances required by this section shall be in the form of a certification agreed to by the applicant or its authorized agent.

Section 9. Methodology for computing the number of adult open heart surgical cases

Sec. 9. (1) The weights for the adult principal and non-principal diagnoses tables found in Appendix A are calculated using the following methodology. For these two tables, only the MIDB data from licensed hospitals that have operational OHS programs in Michigan will be used. Using the hospitals' actual inpatient discharge data, as specified by the most recent MIDB data available to the Department, the discharges that were from patients aged 15 years and older shall be identified. These discharges shall be known as the "adult discharges."

(a) To calculate the weights for the principal diagnosis, the following steps shall be taken:

(i) For each diagnostic group in the principal weight table, the discharges having a primary diagnosis matching any diagnosis in the diagnostic group are identified. The number of discharges is counted.

(ii) For the discharges identified in subsection 9(1)(a)(i), any occurrence of an open heart procedure code will be considered as a single OHS case. For each diagnostic group, the number of OHS cases is counted.

(iii) The number of OHS cases for each diagnosis category identified in subsection 9(1)(a)(ii) will be divided by the number of discharges identified in subsection 9(1)(a)(i). This will be the weight for that diagnostic group. This number should show six decimal positions.

(iv) All discharges utilized for the computation of the principal weight table are to be removed from subsequent analyses.

(b) To calculate the weights for the non-principal diagnosis table, the following steps shall be taken, separately, in the sequence of the group order found in the non-principal diagnosis table:

(i) Each remaining discharge will be examined for any mention of the diagnostic codes from that group. If a match is found, that discharge is assigned to that diagnostic group and removed from subsequent analyses. The number of discharges in each diagnostic group is counted.

(ii) For each diagnostic group taken separately, in the sequence shown, any occurrence of an open heart procedure code for each discharge will be counted as a single OHS case. If a match is found, the discharge will be considered as an open heart surgical case for that diagnostic group and removed from subsequent analyses. The number of open heart surgical cases in each diagnostic group is counted.

(iii) The number of OHS cases for each non-principal diagnosis category identified in subsection 9(1)(b)(ii) will be divided by the number of discharges identified in subsection 9(1)(b)(i). This will result in the non-principal weight for that diagnostic group. This number should show six decimal positions.

(2) An applicant shall apply the methodology set forth in this section for computing the projected number of adult open heart surgical cases using both the principal and non-principal diagnosis tables. The following steps shall be taken in sequence:

(a) For each diagnostic group in the principal weight table in Appendix A, identify the corresponding number of discharges.

(b) Multiply the number of discharges for each diagnostic group by their respective group weight to obtain the projected number of OHS cases for that group. All discharges identified in subsection 9(2)(a) are removed from subsequent analysis.

(c) The non-principal weight table identifies the sequence that must be followed to count the discharges for the appropriate group. An applicant shall start with the first diagnostic group and shall count the number of discharges with any mention of a non-principal diagnosis corresponding to that specific diagnostic group. When a discharge that belongs in the specific non-principal diagnostic group is identified, it is assigned to that group. This discharge is then removed from the data before counting discharges for the next diagnostic group. The discharges counted for each group will be used only with the non-principal diagnosis weight table in Appendix A and will be entered into its respective diagnostic group. Multiply the number of discharges for each diagnostic group by their respective group weight to obtain the projected number of OHS cases for that group.

(d) The total number of projected open heart cases is then calculated by summing the projected number of open heart cases from both principal and non-principal weight tables.

(3) The major ICD-9-CM groupings (See Appendix D for ICD-10-CM Codes) and Open Heart utilization weights in Appendix A are based on the work of the Bureau of Policy and Planning, Michigan Department of Community Health, utilizing the most current MIDB data available to the Department.

(a) The Department shall update the open heart utilization weights every 3 years, beginning with the year 2007, according to the methodology described in subsection (1) above, utilizing the most current MIDB data available to the Department.

(b) Updates to the utilization weights made pursuant to this subsection shall not require standard advisory committee action, a public hearing, or submittal of the standard to the legislature and governor in order to become effective.

(c) The Department shall notify the Commission when the updates are made and the effective date of the updated utilization weights.

(d) The updated open heart utilization weights established pursuant to this subsection shall supersede the weights shown in Appendix A and shall be included as an amended appendix to these standards.

(4) Each applicant shall provide access to verifiable hospital-specific data and documentation using a format established by the Department and a mutually agreed upon media.

Section 10. Methodology for computing the number of pediatric open heart surgical cases

Sec. 10. (1) The weights for the pediatric diagnosis table found in Appendix B are calculated using the following methodology. Only the MIDB data from licensed hospitals that have operational OHS programs in Michigan will be used.

(a) Using the hospitals' actual inpatient discharge data, as specified by the most recent MIDB data available to the Department, the discharges that were from patients of any age that have a diagnosis (any mention) of the ICD-9-CM codes (See Appendix E for ICD-10-CM Codes) listed in the "Congenital Anomalies" category in Appendix B shall be counted. Each identified record shall be counted only once so that no record is counted twice. An applicant shall remove these cases from subsequent analyses.

(b) For those discharges identified in subsection 10(1)(a), any occurrence of an open heart procedure code will be considered as a single OHS case. The number of open heart surgical cases is counted.

(c) The number of OHS cases for the "Congenital Anomalies" category identified in subsection 10(1)(b) will be divided by the number of discharges identified in subsection 10(1)(a). This will be the weight for the "Congenital Anomalies" diagnostic group. This number should show six decimal positions.

(d) Using the hospitals' remaining inpatient discharges, the discharges that were from patients aged 14 years and younger shall be identified. These discharges shall be known as the "pediatric discharges."

(e) Using the "pediatric discharges" identified in subsection 10(1)(d), the number of discharges that have a diagnosis (any mention) of the ICD-9-CM codes (See Appendix E for ICD-10-CM Codes) listed in the "All Other Heart Conditions" category in Appendix B shall be counted. Discharge records which do not have one or more of the "All Other Heart Conditions" codes listed in Appendix B shall not be used. Each identified record shall be counted only once so that no record is counted twice.

(f) For those discharges identified in subsection 10(1)(e), any occurrence of an open heart procedure code will be considered as a single OHS case. The number of open heart surgical cases is counted.

(g) The number of OHS cases for the "All Other Heart Conditions" category identified in subsection 10(1)(f) will be divided by the number of discharges identified in subsection 10(1)(e). This will be the weight for the "All Other Heart Conditions" diagnostic group. This number should show six decimal positions.

(2) An applicant shall apply the methodology set forth in this section for computing the projected number of pediatric open heart surgical cases. In applying discharge data in the methodology, each applicable inpatient record is used only once. This methodology shall utilize only those inpatient discharges that have one or more of the cardiac diagnoses listed in Appendix B. In applying this methodology, the following steps shall be taken in sequence:

(a) Using a hospital's actual inpatient discharge data, as specified by the most recent MIDB data available to the Department, an applicant shall count the discharges that were from patients of any age that have a principal diagnosis or any of the first four non-principal diagnoses of the ICD-9-CM codes (See Appendix E for ICD-10-CM Codes) listed in the "Congenital Anomalies" category in Appendix B. Each identified record shall be counted only once so that no record is counted twice. An applicant shall remove these cases from the discharge data.

(b) Using a hospital's remaining inpatient discharges, an applicant shall identify the discharges that were from patients aged 14 years and younger. These discharges shall be known as the "pediatric discharges."

(c) Using the "pediatric discharges" identified in Subdivision (b), an applicant shall count the number of discharges with a principal diagnosis or any of the first four non-principal diagnoses of the ICD-9-CM codes (See Appendix E for ICD-10-CM Codes) listed in the "All Other Heart Conditions" category in Appendix B. Discharge records which do not have one or more of the "All Other Heart Conditions" codes listed in Appendix B shall not be used. Each identified record shall be counted only once so that no record is counted twice.

(d) An applicant shall multiply the count for the "Congenital" and "All Other Heart Conditions" categories by the corresponding Pediatric Open Heart Utilization Weight and add the products together to produce the number of pediatric open heart surgical cases for the applicant.

(3) The major ICD-9-CM groupings (See Appendix E for ICD-10-CM Codes) and Pediatric Open Heart Utilization Weights in Appendix B are based on the work of the Bureau of Policy and Planning, Michigan Department of Community Health, utilizing the most current MIDB data available to the Department.

(a) The Department shall update the open heart utilization weights every 3 years, beginning with the year 2007, according to the methodology described in subsection (1) above, utilizing the most current MIDB data available to the Department.

(b) Updates to the utilization weights made pursuant to this subsection shall not require standard advisory committee action, a public hearing, or submittal of the standard to the legislature and governor in order to become effective.

(c) The Department shall notify the Commission when the updates are made and the effective date of the updated utilization weights.

(d) The updated open heart utilization weights established pursuant to this subsection shall supersede the weights shown in Appendix B and shall be included as an amended appendix to these standards.

(4) Each applicant must provide access to verifiable hospital-specific data and documentation using a format established by the Department and in a mutually agreed upon media.

Section 11. Planning Areas

Sec. 11. Counties assigned to each planning area are as follows:

<u>PLANNING AREA</u>		<u>COUNTIES</u>	
1	Livingston Macomb Wayne	Monroe Oakland	St. Clair Washtenaw
2	Clinton Eaton	Hillsdale Ingham	Jackson Lenawee
3	Barry Berrien Branch	Calhoun Cass Kalamazoo	St. Joseph Van Buren
4	Allegan Ionia Kent Lake	Mason Mecosta Montcalm Muskegon	Newaygo Oceana Osceola Ottawa
5	Genesee	Lapeer	Shiawassee
6	Arenac Bay Clare Gladwin Gratiot	Huron Iosco Isabella Midland Ogemaw	Roscommon Saginaw Sanilac Tuscola
7	Alcona Alpena Antrim Benzie Charlevoix Cheboygan	Crawford Emmet Gd Traverse Kalkaska Leelanau Manistee	Missaukee Montmorency Oscoda Otsego Presque Isle Wexford
8	Alger Baraga Chippewa Delta Dickinson	Gogebic Houghton Iron Keweenaw Luce	Mackinac Marquette Menominee Ontonagon Schoolcraft

Section 12. Effect on prior planning policies; comparative reviews

Sec. 12. (1) These CON Review Standards supersede and replace the CON Review Standards for OHS Services approved by the CON Commission on September 20, 2018 and effective on December 26, 2018.

(2) Projects reviewed under these standards shall not be subject to comparative review.

APPENDIX A

**DIAGNOSIS GROUPINGS FOR ADULT OPEN HEART SURGICAL CASES
PRINCIPAL DIAGNOSIS
(See Appendix D for ICD-10-CM Codes)**

<u>GROUP</u>	<u>MAJOR ICD-9-CM CODE GROUP</u>	<u>CATEGORY</u>	<u>ADULT OPEN HEART UTILIZATION WEIGHTS</u>
A	394 – 397.9 421 – 421.9 424 – 424.99	Valves	.363373
B	441.01, 441.03 441.1, 441.2 441.6, 441.7	Aortic Aneurysm	.611805
C	745 – 747.99	Congenital Anomalies	.576667
D	414 – 414.99	Other Chronic Ischemic	.566469
E	410 – 410.99	Acute Myocardial Infarct	.127174
F	212.7 398 – 398.99 411 – 411.99 423 – 423.9 425 – 425.9 427 – 427.9 428 – 428.9 901 – 901.9 996.02, 996.03	All Other Heart Conditions	.017273

NON-PRINCIPAL DIAGNOSES

<u>GROUP</u>	<u>MAJOR ICD-9-CM CODE GROUP</u>	<u>CATEGORY</u>	<u>ADULT OPEN HEART UTILIZATION WEIGHTS</u>
A	745 – 747.99	Congenital Anomalies	.041863
B	441.01, 441.03 441.1, 441.2 441.6, 441.7	Aortic Aneurysm	.034960
C	410 – 410.99	Acute Myocardial Infarct	.042822
D	394 – 397.9 421 – 421.9 424 – 424.99	Valves	.025281

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E	414 – 414.99	Other Chronic Ischemic	.012645
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F	212.7	All Other Heart Conditions	.020171
	398 – 398.99		
	411 – 411.99		
	423 – 423.9		
	425 – 425.9		
	427 – 427.9		
	428 – 428.9		
	901 – 901.9		
	996.02, 996.03		

Source: Calculated based on the 2021 Michigan Inpatient Data Base
Amended and Effective May 11, 2023

APPENDIX B

**DIAGNOSIS GROUPINGS FOR PEDIATRIC OPEN HEART SURGICAL CASES
(See Appendix E for ICD-10-CM Codes)**

<u>MAJOR ICD-9-CM CODE GROUP</u>	<u>CATEGORY</u>	<u>PEDIATRIC OPEN HEART UTILIZATION WEIGHTS</u>
745.0 – 747.99	Congenital Anomalies	.157735
164.1, 212.7 390 – 429.99 441.01, 441.03 441.1, 441.2 441.6, 441.7 785.51 786.5-786.59 901.0 – 901.9 996.02	All Other Heart Conditions	.014799

Source: Calculated based on the 2021 Michigan Inpatient Data Base
Amended and Effective May 11, 2023.

APPENDIX C

ICD-9-CM TO ICD-10-CM CODE TRANSLATION FOR CONGENITAL HEART DISEASE

ICD-9 CODE	DESCRIPTION	ICD-10 CODE	DESCRIPTION
745.0 through 747.99	Congenital Heart Disease	P29.3	Persistent Fetal Circulation
		Q20.0-Q28.9	Congenital Malformations of the Circulatory System

"ICD-9-CM Code" means the disease codes and nomenclature found in the International Classification of Diseases - 9TH Revision - Clinical Modification, prepared by the Commission on Professional and Hospital Activities for The U.S. National Center for Health Statistics.

"ICD-10-CM Code" means the disease codes and nomenclature found in the International Classification of Diseases - 10th Revision - Clinical Modification, National Center for Health Statistics.

APPENDIX D**ICD-9-CM TO ICD-10-CM CODE TRANSLATION FOR APPENDIX A**

ICD-9 CODE	DESCRIPTION	ICD-10 CODE	DESCRIPTION
394 – 397.9	Valves	I05.0-I08.9	Rheumatic Valve Diseases
		I09.0-I09.89	Other Rheumatic Heart Diseases
421 – 421.9	Valves	A01.02	Typhoid Fever with Heart Involvement
		I33.0-I33.9	Acute and Subacute Endocarditis
		I39	Endocarditis and Heart Valve Disorders In Diseases Classified Elsewhere
424 – 424.99	Valves	A18.84	Tuberculosis of Heart
		I34.0-I37.9	Nonrheumatic Valve Disorders
		I38	Endocarditis, Valve Unspecified
		I39	Endocarditis and Heart Valve Disorders in Diseases Classified Elsewhere
		I42.0-I43	Cardiomyopathies
		M32.11	Endocarditis in Systemic Lupus Erythematosus
441.01, 441.03	Aortic Aneurysm	I71.01, I71.03	Dissection of Thoracic/Thoracoabdominal Aorta
441.1, 441.2	Aortic Aneurysm	I71.1, I71.2	Thoracic Aortic Aneurysm, Ruptured/Without Rupture
441.6, 441.7	Aortic Aneurysm	I71.5, I71.6	Thoracoabdominal Aortic Aneurysm, Ruptured/without Rupture
745 – 747.99	Congenital Anomalies	P29.3	Persistent Fetal Circulation
		Q20.0-Q28.9	Congenital Malformations of the Circulatory System
414 – 414.99	Other Chronic Ischemic	I25.10-I25.9 (EXCLUDING I25.2 OLD MI)	Chronic Ischemic Heart Disease
410 – 410.99	Acute Myocardial Infarct	I21.01-I22.9	Stemi And Nstemi Mi
212.7	All Other Heart Conditions	D15.1	Benign Neoplasm of Heart
398 – 398.99	All Other Heart Conditions	I09.0	Rheumatic Myocarditis
		I09.81-I09.9	Other/Unspecified Rheumatic Heart Diseases
411 – 411.99	All Other Heart Conditions	I20.0	Unstable Angina
		I24.0-I24.9	Other Acute Ischemic Heart Disease

APPENDIX D continued

ICD-9 CODE	DESCRIPTION	ICD-10 CODE	DESCRIPTION
411 – 411.99 Continued	All Other Heart Conditions Continued	I25.110, I25.700, I25.710, I25.720, I25.730, I25.750, I25.760, I25.790	Atherosclerosis with Unstable Angina Pectoris
423 – 423.9	All Other Heart Conditions	I31.0-I31.9	Other Diseases of Pericardium
425 – 425.9	All Other Heart Conditions	A18.84	Tuberculosis of Heart
		I42.0-I43	Cardiomyopathies
427 – 427.9	All Other Heart Conditions	I46.2-I46.9	Cardiac Arrest
		I47.0-I47.9	Paroxysmal Tachycardia
		I48.0-I48.92	Atrial Fibrillation and Flutter
		I49.01-I49.9	Other Cardiac Arrhythmias
		R00.1	Bradycardia, Unspecified
428 – 428.9	All Other Heart Conditions	I50.1-I50.9	Heart Failure
901 – 901.9	All Other Heart Conditions	S25.00XA	Unspecified Injury of Thoracic Aorta, Initial Encounter
		S25.01XA	Minor Laceration of Thoracic Aorta, Initial Encounter
		S25.02XA	Major Laceration of Thoracic Aorta, Initial Encounter
		S25.09XA	Other Specified Injury of Thoracic Aorta, Initial Encounter
		S25.101A	Unspecified Injury of Right Innominate or Subclavian Artery, Initial Encounter
		S25.102A	Unspecified Injury of Left Innominate or Subclavian Artery, Initial Encounter
		S25.109A	Unspecified Injury of Unspecified Innominate or Subclavian Artery, Initial Encounter
		S25.111A	Minor Laceration of Right Innominate or Subclavian Artery, Initial Encounter
		S25.112A	Minor Laceration of Left Innominate or Subclavian Artery, Initial Encounter
		S25.119A	Minor Laceration of Unspecified Innominate or Subclavian Artery, Initial Encounter
		S25.121A	Major Laceration of Right Innominate or Subclavian Artery, Initial Encounter

APPENDIX D continued

ICD-9 CODE	DESCRIPTION	ICD-10 CODE	DESCRIPTION
901 – 901.9 Continued	All Other Heart Conditions Continued	S25.122A	Major Laceration of Left Innominate or Subclavian Artery, Initial Encounter
		S25.129A	Major Laceration of Unspecified Innominate or Subclavian Artery, Initial Encounter
		S25.191A	Other Specified Injury of Right Innominate or Subclavian Artery, Initial Encounter
		S25.192A	Other Specified Injury of Left Innominate or Subclavian Artery, Initial Encounter
		S25.199A	Other Specified Injury of Unspecified Innominate or Subclavian Artery, Initial Encounter
		S25.20XA	Unspecified Injury of Superior Vena Cava, Initial Encounter
		S25.21XA	Minor Laceration of Superior Vena Cava, Initial Encounter
		S25.22XA	Major Laceration of Superior Vena Cava, Initial Encounter
		S25.29XA	Other Specified Injury of Superior Vena Cava, Initial Encounter
		S25.301A	Unspecified Injury of Right Innominate or Subclavian Vein, Initial Encounter
		S25.302A	Unspecified Injury of Left Innominate or Subclavian Vein, Initial Encounter
		S25.309A	Unspecified Injury of Unspecified Innominate or Subclavian Vein, Initial Encounter
		S25.311A	Minor Laceration of Right Innominate or Subclavian Vein, Initial Encounter
		S25.312A	Minor Laceration of Left Innominate or Subclavian Vein, Initial Encounter
		S25.319A	Minor Laceration of Unspecified Innominate or Subclavian Vein, Initial Encounter
		S25.321A	Major Laceration of Right Innominate or Subclavian Vein, Initial Encounter
		S25.322A	Major Laceration of Left Innominate or Subclavian Vein, Initial Encounter

APPENDIX D continued

ICD-9 CODE	DESCRIPTION	ICD-10 CODE	DESCRIPTION
901 – 901.9 Continued	All Other Heart Conditions Continued	S25.329A	Major Laceration of Unspecified Innominate or Subclavian Vein, Initial Encounter
		S25.391A	Other Specified Injury of Right Innominate or Subclavian Vein, Initial Encounter
		S25.392A	Other Specified Injury of Left Innominate or Subclavian Vein, Initial Encounter
		S25.399A	Other Specified Injury of Unspecified Innominate or Subclavian Vein, Initial Encounter
		S25.401A	Unspecified Injury of Right Pulmonary Blood Vessels, Initial Encounter
		S25.402A	Unspecified Injury of Left Pulmonary Blood Vessels, Initial Encounter
		S25.409A	Unspecified Injury of Unspecified Pulmonary Blood Vessels, Initial Encounter
		S25.411A	Minor Laceration of Right Pulmonary Blood Vessels, Initial Encounter
		S25.412A	Minor Laceration of Left Pulmonary Blood Vessels, Initial Encounter
		S25.419A	Minor Laceration of Unspecified Pulmonary Blood Vessels, Initial Encounter
		S25.421A	Major Laceration of Right Pulmonary Blood Vessels, Initial Encounter
		S25.422A	Major Laceration of Left Pulmonary Blood Vessels, Initial Encounter
		S25.429A	Major Laceration of Unspecified Pulmonary Blood Vessels, Initial Encounter
		S25.491A	Other Specified Injury of Right Pulmonary Blood Vessels, Initial Encounter
		S25.492A	Other Specified Injury of Left Pulmonary Blood Vessels, Initial Encounter
		S25.499A	Other Specified Injury of Unspecified Pulmonary Blood Vessels, Initial Encounter

APPENDIX D continued

ICD-9 CODE	DESCRIPTION	ICD-10 CODE	DESCRIPTION
901 – 901.9 Continued	All Other Heart Conditions Continued	S25.501A	Unspecified Injury of Intercostal Blood Vessels, Right Side, Initial Encounter
		S25.502A	Unspecified Injury of Intercostal Blood Vessels, Left Side, Initial Encounter
		S25.509A	Unspecified Injury of Intercostal Blood Vessels, Unspecified Side, Initial Encounter
		S25.511A	Laceration of Intercostal Blood Vessels, Right Side, Initial Encounter
		S25.512A	Laceration of Intercostal Blood Vessels, Left Side, Initial Encounter
		S25.519A	Laceration of Intercostal Blood Vessels, Unspecified Side, Initial Encounter
		S25.591A	Other Specified Injury of Intercostal Blood Vessels, Right Side, Initial Encounter
		S25.592A	Other Specified Injury of Intercostal Blood Vessels, Left Side, Initial Encounter
		S25.599A	Other Specified Injury of Intercostal Blood Vessels, Unspecified Side, Initial Encounter
		S25.801A	Unspecified Injury of Other Blood Vessels of Thorax, Right Side, Initial Encounter
		S25.802A	Unspecified Injury of Other Blood Vessels of Thorax, Left Side, Initial Encounter
		S25.809A	Unspecified Injury of Other Blood Vessels of Thorax, Unspecified Side, Initial Encounter
		S25.811A	Laceration of Other Blood Vessels of Thorax, Right Side, Initial Encounter
		S25.812A	Laceration of Other Blood Vessels of Thorax, Left Side, Initial Encounter
		S25.819A	Laceration of Other Blood Vessels of Thorax, Unspecified Side, Initial Encounter
		S25.891A	Other Specified Injury of Other Blood Vessels of Thorax, Right Side, Initial Encounter

APPENDIX D continued

ICD-9 CODE	DESCRIPTION	ICD-10 CODE	DESCRIPTION
901 – 901.9 Continued	All Other Heart Conditions Continued	S25.892A	Other Specified Injury of Other Blood Vessels of Thorax, Left Side, Initial Encounter
		S25.899A	Other Specified Injury of Other Blood Vessels of Thorax, Unspecified Side, Initial Encounter
		S25.90XA	Unspecified Injury of Unspecified Blood Vessel of Thorax, Initial Encounter
		S25.91XA	Laceration of Unspecified Blood Vessel of Thorax, Initial Encounter
		S25.99XA	Other Specified Injury of Unspecified Blood Vessel of Thorax, Initial Encounter
996.02, 996.03	All Other Heart Conditions	T82.01XA	Breakdown (Mechanical) of Heart Valve Prosthesis, Initial Encounter
		T82.02XA	Displacement of Heart Valve Prosthesis, Initial Encounter
		T82.03XA	Leakage of Heart Valve Prosthesis, Initial Encounter
		T82.09XA	Other Mechanical Complication of Heart Valve Prosthesis, Initial Encounter
		T82.211A	Breakdown (Mechanical) of Coronary Artery Bypass Graft, Initial Encounter
		T82.212A	Displacement of Coronary Artery Bypass Graft, Initial Encounter
		T82.213A	Leakage of Coronary Artery Bypass Graft, Initial Encounter
		T82.218A	Other Mechanical Complication of Coronary Artery Bypass Graft, Initial Encounter

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APPENDIX E**ICD-9-CM TO ICD-10-CM CODE TRANSLATION FOR APPENDIX B**

ICD-9 CODE	DESCRIPTION	ICD-10 CODE	DESCRIPTION
745.0 – 747.99	Congenital Anomalies	P29.3	Persistent Fetal Circulation
		Q20.0-Q28.9	Congenital Malformations of the Circulatory System
164.1	All Other Heart Conditions	C38.0	Malignant Neoplasm of Heart
		C45.2	Mesothelioma of Pericardium
212.7	All Other Heart Conditions	D15.1	Benign Neoplasm of Heart
390 - 429.99	All Other Heart Conditions	A01.02	Typhoid Fever with Heart Involvement
		A18.84	Tuberculosis of Heart
		I00-I09.9	Rheumatic Fever/Heart Diseases
		I10-I15.9	Hypertensive Diseases
		I20.0-I25.9	Ischemic Heart Diseases
		I26.01-I28.9	Pulmonary Heart Disease/Pulmonary Circulation Diseases
		I30.0-I52	Other Forms of Heart Disease
		I97.0-197.191	Intraoperative/Postprocedural Cardiac Complications
		N26.2	Page Kidney
		R00.1	Bradycardia, Unspecified
		T80.0XXA	Air Embolism Following Infusion, Transfusion and Therapeutic Injection, Initial Encounter
		T81.718A	Complication of Other Artery Following a Procedure, Not Elsewhere Classified, Initial Encounter
		T81.72XA	Complication of Vein Following a Procedure, not Elsewhere Classified, Initial Encounter
		T82.817A	Embolism of Cardiac Prosthetic Devices, Implants and Grafts, Initial Encounter
		T82.818A	Embolism of Vascular Prosthetic Devices, Implants and Grafts, Initial Encounter
441.01	All Other Heart Conditions	I71.01	Dissection of Thoracic Aorta
441.03	All Other Heart Conditions	I71.03	Dissection of Thoracoabdominal Aorta

APPENDIX E continued

ICD-9 CODE	DESCRIPTION	ICD-10 CODE	DESCRIPTION
441.1	All Other Heart Conditions	I71.1	Thoracic Aortic Aneurysm, Ruptured
441.2	All Other Heart Conditions	I71.2	Thoracic Aortic Aneurysm, without Rupture
441.6	All Other Heart Conditions	I71.5	Thoracoabdominal Aortic Aneurysm, Ruptured
441.7	All Other Heart Conditions	I71.6	Thoracoabdominal Aortic Aneurysm, Without Rupture
785.51	All Other Heart Conditions	R57.0	Cardiogenic Shock
786.5-786.59	All Other Heart Conditions	R07.1-R07.9	Chest Pain
901.0 – 901.9	All Other Heart Conditions	S25.00XA	Unspecified Injury of Thoracic Aorta, Initial Encounter
		S25.01XA	Minor Laceration of Thoracic Aorta, Initial Encounter
		S25.02XA	Major Laceration of Thoracic Aorta, Initial Encounter
		S25.09XA	Other Specified Injury of Thoracic Aorta, Initial Encounter
		S25.101A	Unspecified Injury of Right Innominate Or Subclavian Artery, Initial Encounter
		S25.102A	Unspecified Injury of Left Innominate or Subclavian Artery, Initial Encounter
		S25.109A	Unspecified Injury of Unspecified Innominate or Subclavian Artery, Initial Encounter
		S25.111A	Minor Laceration of Right Innominate or Subclavian Artery, Initial Encounter
		S25.112A	Minor Laceration of Left Innominate or Subclavian Artery, Initial Encounter
		S25.119A	Minor Laceration of Unspecified Innominate or Subclavian Artery, Initial Encounter
		S25.121A	Major Laceration of Right Innominate or Subclavian Artery, Initial Encounter

APPENDIX E continued

ICD-9 CODE	DESCRIPTION	ICD-10 CODE	DESCRIPTION
901.0 – 901.9 Continued	All Other Heart Conditions Continued	S25.122A	Major Laceration of Left Innominate or Subclavian Artery, Initial Encounter
		S25.129A	Major Laceration of Unspecified Innominate or Subclavian Artery, Initial Encounter
		S25.191A	Other Specified Injury of Right Innominate or Subclavian Artery, Initial Encounter
		S25.192A	Other Specified Injury of Left Innominate or Subclavian Artery, Initial Encounter
		S25.199A	Other Specified Injury of Unspecified Innominate or Subclavian Artery, Initial Encounter
		S25.20XA	Unspecified Injury of Superior Vena Cava, Initial Encounter
		S25.21XA	Minor Laceration of Superior Vena Cava, Initial Encounter
		S25.22XA	Major Laceration of Superior Vena Cava, Initial Encounter
		S25.29XA	Other Specified Injury of Superior Vena Cava, Initial Encounter
		S25.301A	Unspecified Injury of Right Innominate or Subclavian Vein, Initial Encounter
		S25.302A	Unspecified Injury of Left Innominate or Subclavian Vein, Initial Encounter
		S25.309A	Unspecified Injury of Unspecified Innominate or Subclavian Vein, Initial Encounter
		S25.311A	Minor Laceration of Right Innominate or Subclavian Vein, Initial Encounter
		S25.312A	Minor Laceration of Left Innominate or Subclavian Vein, Initial Encounter
		S25.319A	Minor Laceration of Unspecified Innominate or Subclavian Vein, Initial Encounter
		S25.321A	Major Laceration of Right Innominate or Subclavian Vein, Initial Encounter
		S25.322A	Major Laceration of Left Innominate or Subclavian Vein, Initial Encounter

APPENDIX E continued

ICD-9 CODE	DESCRIPTION	ICD-10 CODE	DESCRIPTION
901.0 – 901.9 Continued	All Other Heart Conditions Continued	S25.329A	Major Laceration of Unspecified Innominate or Subclavian Vein, Initial Encounter
		S25.391A	Other Specified Injury of Right Innominate or Subclavian Vein, Initial Encounter
		S25.392A	Other Specified Injury of Left Innominate or Subclavian Vein, Initial Encounter
		S25.399A	Other Specified Injury of Unspecified Innominate or Subclavian Vein, Initial Encounter
		S25.401A	Unspecified Injury of Right Pulmonary Blood Vessels, Initial Encounter
		S25.402A	Unspecified Injury of Left Pulmonary Blood Vessels, Initial Encounter
		S25.409A	Unspecified Injury of Unspecified Pulmonary Blood Vessels, Initial Encounter
		S25.411A	Minor Laceration of Right Pulmonary Blood Vessels, Initial Encounter
		S25.412A	Minor Laceration of Left Pulmonary Blood Vessels, Initial Encounter
		S25.419A	Minor Laceration of Unspecified Pulmonary Blood Vessels, Initial Encounter
		S25.421A	Major Laceration of Right Pulmonary Blood Vessels, Initial Encounter
		S25.422A	Major Laceration of Left Pulmonary Blood Vessels, Initial Encounter
		S25.429A	Major Laceration of Unspecified Pulmonary Blood Vessels, Initial Encounter
		S25.491A	Other Specified Injury of Right Pulmonary Blood Vessels, Initial Encounter
		S25.492A	Other Specified Injury of Left Pulmonary Blood Vessels, Initial Encounter
		S25.499A	Other Specified Injury of Unspecified Pulmonary Blood Vessels, Initial Encounter

APPENDIX E continued

ICD-9 CODE	DESCRIPTION	ICD-10 CODE	DESCRIPTION
901.0 – 901.9 Continued	All Other Heart Conditions Continued	S25.501A	Unspecified Injury of Intercostal Blood Vessels, Right Side, Initial Encounter
		S25.502A	Unspecified Injury of Intercostal Blood Vessels, Left Side, Initial Encounter
		S25.509A	Unspecified Injury of Intercostal Blood Vessels, Unspecified Side, Initial Encounter
		S25.511A	Laceration of Intercostal Blood Vessels, Right Side, Initial Encounter
		S25.512A	Laceration of Intercostal Blood Vessels, Left Side, Initial Encounter
		S25.519A	Laceration of Intercostal Blood Vessels, Unspecified Side, Initial Encounter
		S25.591A	Other Specified Injury of Intercostal Blood Vessels, Right Side, Initial Encounter
		S25.592A	Other Specified Injury of Intercostal Blood Vessels, Left Side, Initial Encounter
		S25.599A	Other Specified Injury of Intercostal Blood Vessels, Unspecified Side, Initial Encounter
		S25.801A	Unspecified Injury of Other Blood Vessels Of Thorax, Right Side, Initial Encounter
		S25.802A	Unspecified Injury of Other Blood Vessels of Thorax, Left Side, Initial Encounter
		S25.809A	Unspecified Injury of Other Blood Vessels of Thorax, Unspecified Side, Initial Encounter
		S25.811A	Laceration of Other Blood Vessels of Thorax, Right Side, Initial Encounter
		S25.812A	Laceration of Other Blood Vessels of Thorax, Left Side, Initial Encounter
		S25.819A	Laceration of Other Blood Vessels of Thorax, Unspecified Side, Initial Encounter
		S25.891A	Other Specified Injury of Other Blood Vessels of Thorax, Right Side, Initial Encounter

APPENDIX E continued

ICD-9 CODE	DESCRIPTION	ICD-10 CODE	DESCRIPTION
901.0 – 901.9 Continued	All Other Heart Conditions Continued	S25.892A	Other Specified Injury of Other Blood Vessels of Thorax, Left Side, Initial Encounter
		S25.899A	Other Specified Injury of Other Blood Vessels of Thorax, Unspecified Side, Initial Encounter
		S25.90XA	Unspecified Injury of Unspecified Blood Vessel of Thorax, Initial Encounter
		S25.91XA	Laceration of Unspecified Blood Vessel of Thorax, Initial Encounter
		S25.99XA	Other Specified Injury of Unspecified Blood Vessel of Thorax, Initial Encounter
996.02	All Other Heart Conditions	T82.01XA	Breakdown (Mechanical) of Heart Valve Prosthesis, Initial Encounter
		T82.02XA	Displacement of Heart Valve Prosthesis, Initial Encounter
		T82.03XA	Leakage of Heart Valve Prosthesis, Initial Encounter
		T82.09XA	Other Mechanical Complication of Heart Valve Prosthesis, Initial Encounter

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