

LABOR MARKET ANALYSIS

FOR PROGRAM RECOMMENDATION



CENTERS OF EXCELLENCE
FOR LABOR MARKET RESEARCH

MEDICAL IMAGING TECHNICIANS IN THE GREATER SACRAMENTO REGION

North (Greater Sacramento)
Center of Excellence

January 2024

TABLE OF CONTENTS

Summary.....	3
Introduction.....	4
Occupational Demand.....	5
Wages	7
Job Postings.....	8
About Job Postings Analysis.....	8
Top Employers and Job Titles.....	8
Top Skills and Qualifications.....	10
Education and Training Requirements	12
Educational Supply.....	13
Community College Supply	14
Other Postsecondary Supply	15
Findings.....	16
Recommendations	18
Appendix A. Methodology and Sources.....	19
Appendix B. Glossary.....	20
Appendix C. MEDICAL IMAGING SPECIALITIES.....	22

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SUMMARY

The North (Greater Sacramento) Center of Excellence for Labor Market Research prepared this report to provide a labor market analysis of educational supply and occupational demand for middle-skilled careers in the North (Greater Sacramento) subregion. This report aims to determine if demand in the local labor market is unmet by the supply from existing community college programs and other postsecondary training providers.

This report primarily focuses on training that leads to jobs in middle-skilled occupations - jobs that typically require education beyond a high school diploma but less than a bachelor's degree - but may include higher-skilled occupations for training pathways that lead to a bachelor's degree. Lowered skilled occupations are rarely considered in this analysis due to the lessened barriers for entry-level work, such as no formal education and fewer on-the-job training requirements.

Key findings include:

- The North (Greater Sacramento) subregion held 2,262 medical imaging-related jobs in 2022. These jobs are projected to increase by 14% over the next five years, adding 316 new jobs to the subregion by 2027.
- Over the next five years, medical imaging-related occupations are projected to have 195 annual openings in the North (Greater Sacramento) subregion.
- Entry-level (25th percentile) wage data shows that the medical imaging occupations included in this report earn \$38.28 to \$47.41 per hour, which is above the subregion's living wage of \$18.72 per hour. (See Appendix B for notes about the updated living wage).
- Awards data analysis shows that North (Greater Sacramento) training providers conferred an average of 32 awards (certificates and associate degrees) in Radiologic Technology (TOP 1225.00) and Diagnostic Medical Sonography (TOP 1227.00) programs over the last three academic years (2019-20 through 2021-22).

Recommendations include:

- The North (Greater Sacramento) Center of Excellence recommends developing a new medical imaging program and making modifications (substantial changes) to existing programs.
- The North (Greater Sacramento) Center of Excellence recommends expanding existing community college programs to meet local demand, primarily since only nine (9) community colleges in Northern California have conferred awards in the last three years.¹

¹ Colleges in the North/Far North and Bay Area Regions (Northern California): Cabrillo, Cañada, Cosumnes River, Folsom Lake, Foothill, Merritt, San Francisco, Santa Rosa, and Yuba

INTRODUCTION

The North (Greater Sacramento) Center of Excellence (COE) was asked to provide labor market information for a proposed program at a regional community college. This report focuses on the following Standard Occupational Classification (SOC) occupations and codes:

- These middle-skill occupations require more education and training beyond a high school diploma but usually less than a four-year degree:
 - Diagnostic Medical Sonographers (29-2032)
 - Radiologic Technologists and Technicians (29-2034)
 - Magnetic Resonance Imaging Technologists (29-2035)

A review of related programs revealed the following Taxonomy of Programs (TOP) titles and codes are appropriate for inclusion in this report:

- Radiologic Technology (1225.00)
- Diagnostic Medical Sonography (1227.00)

The corresponding Classification of Instructional Program (CIP) titles and codes are:

- Diagnostic Medical Sonography/Sonographer and Ultrasound Technician (51.0910)
- Radiologic Technology/Science – Radiographer (51.0911)
- Magnetic Resonance Imaging (MRI) Technology/Technician (51.0920)

OCCUPATIONAL DEMAND

Exhibit 1 summarizes the five-year projected job growth for the three medical imaging occupations in North (Greater Sacramento)², North/Far North, and California.

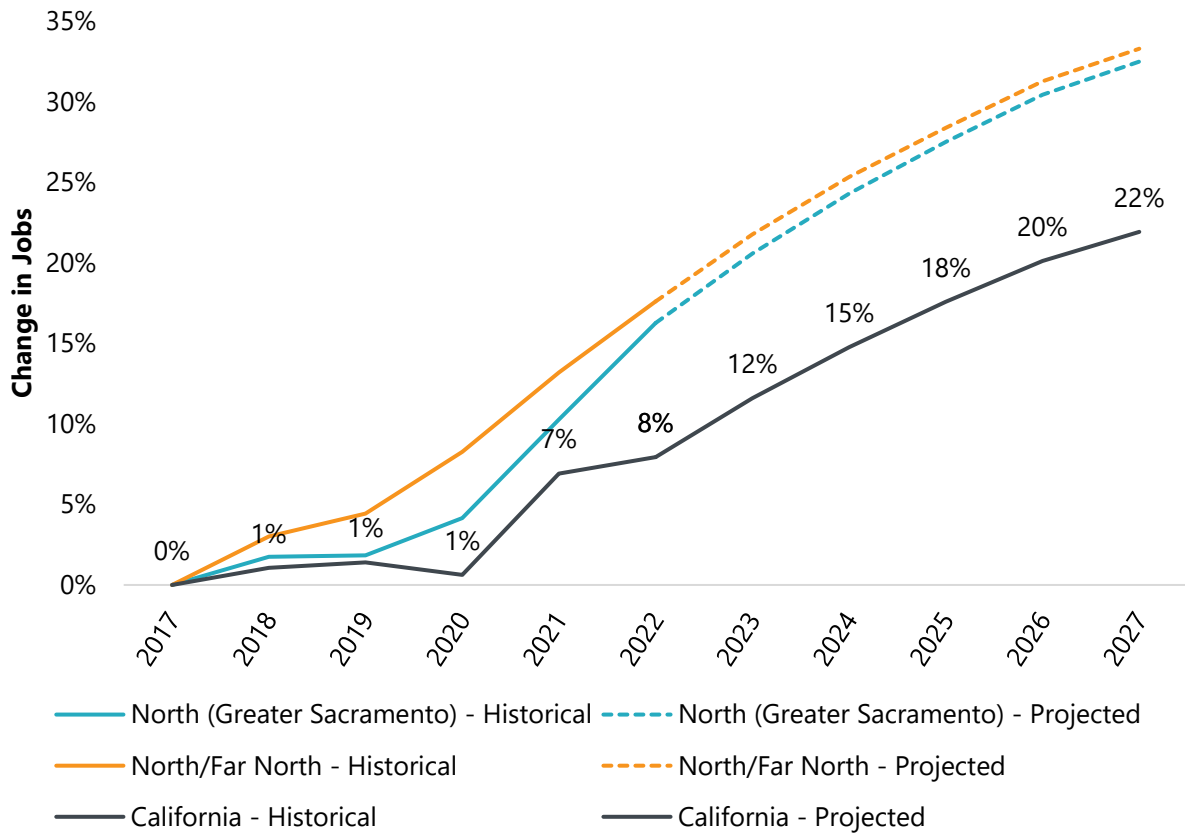
Exhibit 1. Employment and projected demand, 2022-2027

Occupation	2022 Jobs	2027 Jobs	2022-2027 Change	2022-2027 % Change	2022-2027 Annual Openings
Radiologic Technologists and Technicians	1,385	1,575	190	14%	118
Diagnostic Medical Sonographers	692	790	98	14%	60
Magnetic Resonance Imaging Technologists	184	212	28	15%	17
North (Greater Sacramento)	2,262	2,578	316	14%	195
Radiologic Technologists and Technicians	1,822	2,055	232	13%	151
Diagnostic Medical Sonographers	891	1,014	123	14%	76
Magnetic Resonance Imaging Technologists	227	264	37	16%	22
North/Far North	2,941	3,333	392	13%	250
Radiologic Technologists and Technicians	18,687	21,005	2,318	12%	1,534
Diagnostic Medical Sonographers	8,481	9,665	1,184	14%	725
Magnetic Resonance Imaging Technologists	3,066	3,481	415	14%	277
California	30,233	34,151	3,918	13%	2,536

² The North (Greater Sacramento) subregion covers seven counties, including El Dorado, Nevada, Placer, Sacramento, Sutter, Yolo, and Yuba.

Exhibit 2 compares the net changes in jobs between 2017 through 2022 and the projected changes through 2027. The rate of change is indexed to the total number of jobs in 2017.

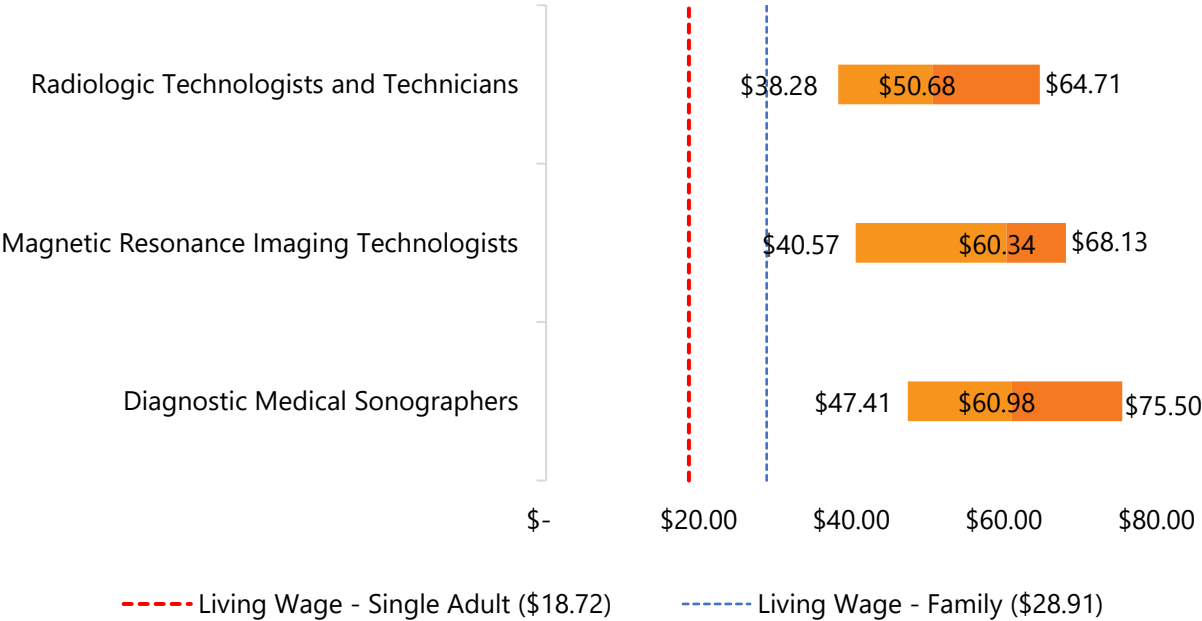
Exhibit 2. Changes in employment, 2017-2027



WAGES

Exhibit 3 compares the 25th percentile, median, and 75th percentile hourly wages for the three medical imaging occupations to the Greater Sacramento living wage for one working adult (\$18.72 per hour) and a small family (\$28.91 per hour).^{3,4} The 25th and 75th percentile hourly wages estimate entry-level and experienced worker wages.

Exhibit 3. Hourly wages by occupation, 2022



³ Living wage is defined as the level of income one working adult with no children must earn to meet basic needs, including food, housing, transportation, healthcare, taxes, and other miscellaneous basic needs. Please note that the 25th-percentile and 75th-percentile hourly wages are used as proxy for entry-level and experienced-level wages.

⁴ A small family is defined as one working adult and one school aged child (between the ages of 5 and 12 years).

JOB POSTINGS

About Job Postings Analysis

This section analyzes recent data from online job postings. Online job postings may provide additional insight into recent changes in the labor market that are not captured by historical trends. However, job postings differ from labor market demand; demand is based on projected annual openings. Job postings should be used to inform community college curriculum development and identify potential employers for targeted experiential learning opportunities.

Please note several limitations to analyzing and interpreting online job postings. Employers may post a position multiple times to increase the number of job applicants. Job postings may remain online after a business chooses not to fill a position. Employers may advertise one posting to fill multiple vacancies. And not all jobs are posted online.

The North COE identified 1,170 online job postings for the selected occupations in the seven-county Greater Sacramento subregion. Job posting data comes from Lightcast (formerly Emsi Burning Glass) and represents unique advertisements newly posted online from Greater Sacramento employers during the last 12 months, from January through December 2023. (Note: 175 job postings were removed from the results because the employers were outside the seven-county Greater Sacramento subregion, including employers from the Bay Area, Oregon, and Nevada).

Top Employers and Job Titles

Exhibit 4 details the number of online job postings for the selected occupations.

Exhibit 4. Job postings by occupation

Occupation	Unique Job Postings	Share of Job Postings
Radiologic Technologists and Technicians	479	48%
Magnetic Resonance Imaging Technologists	304	31%
Diagnostic Medical Sonographers	212	21%
Total Job Postings	995	100%

Exhibit 5 shows the top 10 relevant job titles with the most job postings. Please see Appendix C for a deeper dive into subregional specialties within the job postings.

Exhibit 5. Top jobs titles

Job Title	Number of Job Postings
Radiologic Technologists	147
Sonographers	70
MRI Technologists	66
Radiology Technologists	60
Computed Tomography Technologists	58
Lead CT Technologists	54
Ultrasound Technologists	33
Travel X-Ray Techs	33
Mammography Technologists	32
Ultrasound Technicians	29

Exhibit 6 shows the top relevant employers with the most job postings for the selected occupations.

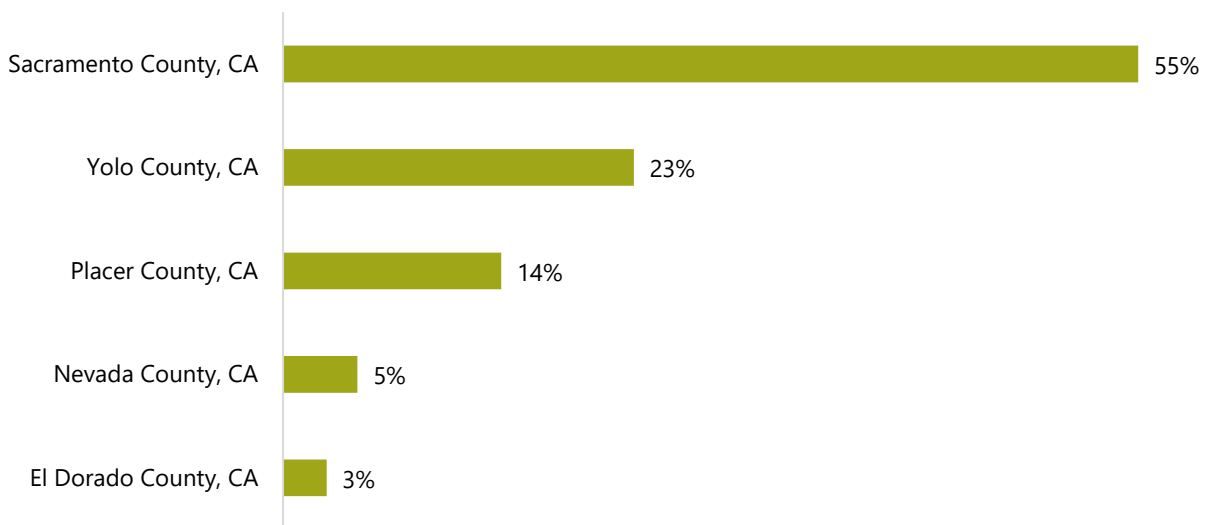
Exhibit 6. Top Employers

Employer	Number of Job Postings
Sutter Health	217
University of California/ UC Davis Health	135
CommonSpirit Health	98
Siemens/ Siemens Healthineers	93
Kaiser Permanente	63
Concentra	20
Adventist Health	20

Employer	Number of Job Postings
Mercy General Hospital	20
United States Department of Veterans Affairs	16
RadNet	16
Sierra Nevada Memorial Hospital	9

Exhibit 7 breaks down the number of job postings by county.

Exhibit 7. Top Employers



Top Skills and Qualifications

Exhibit 8 shows the top skills across three categories for the three medical imaging occupations: specialized, essential, and software skills.⁵

Exhibit 8. Most in-demand skills

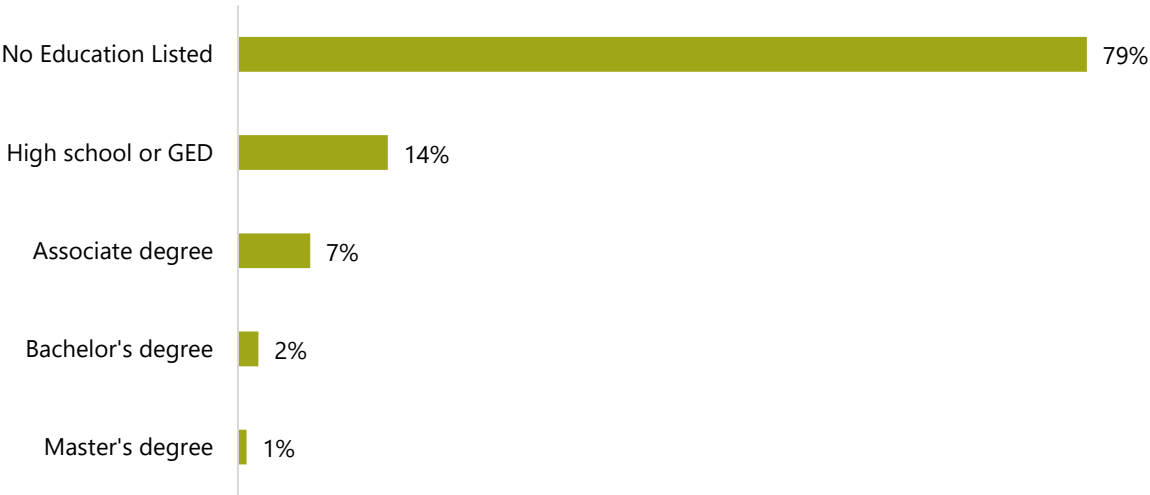
Specialized Skills	Common Skills	Software Skills
Radiology	Communication	Microsoft Excel
Medical Records	Cooperation	Epic EMR
Anatomy	Microsoft Excel	Microsoft Outlook

⁵ Specialized skills are those primarily required to perform specific tasks in an occupation. Essential skills are typically related to employability. These are skills that are prevalent across many occupations, and include both interpersonal attributes and learned skills (aka "soft skills"). Software skills are specific to any software tool or programming component used to support a job.

Specialized Skills	Common Skills	Software Skills
Physiology	Prioritization	Microsoft Office
Medical Terminology	Organizational Skills	MEDITECH EHR
Information Systems	Microsoft Outlook	Audiogram
Radiography	Microsoft Office	Microsoft Word
Pathology	Time Management	Microsoft PowerPoint
Medical Ultrasonography	Management	Microsoft SharePoint
Epic EMR	Ability To Meet Deadlines	Laboratory Information Management Systems

Exhibit 9 shows the minimum level of education employers prefer for the three medical imaging-related job postings in the Greater Sacramento subregion.⁶

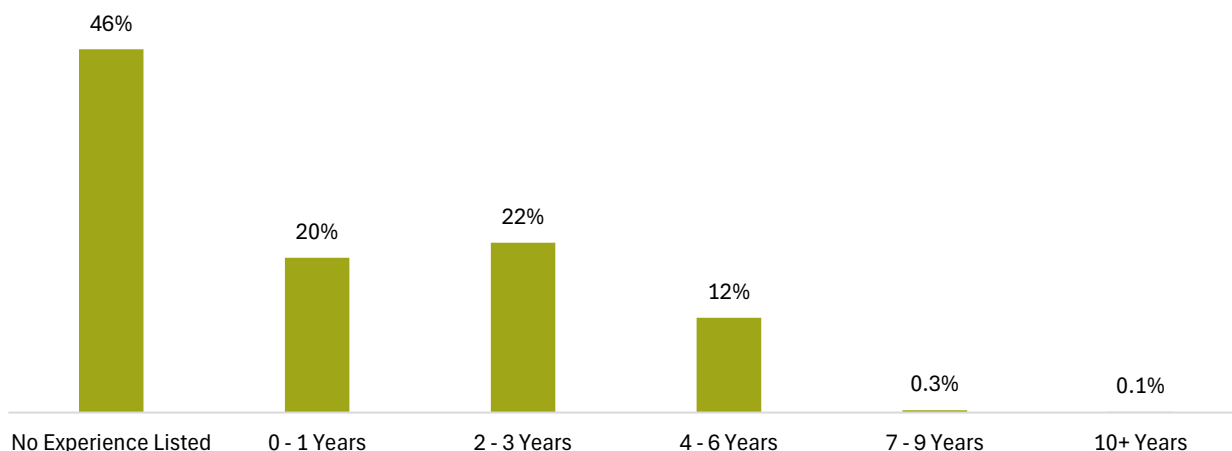
Exhibit 9. Employer-preferred education



⁶ Employers may include more than one level of education as a hiring requirement in a job posting. As a result, the values in exhibit 8 may sum to greater than 100%.

Exhibit 10 shows the minimum experience employers prefer for the three medical imaging-related job postings in the Greater Sacramento subregion.⁷

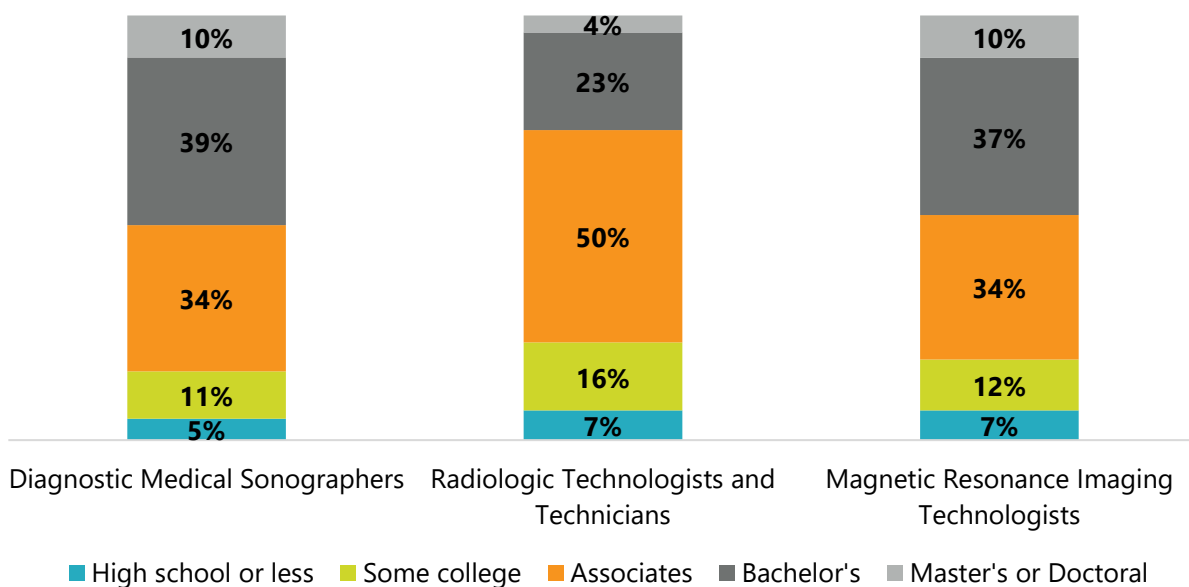
Exhibit 10. Employer-preferred job experience



EDUCATION AND TRAINING REQUIREMENTS

The U.S. Census Bureau collects data on the highest education level achieved by workers across all occupations. Exhibit 11 shows California's educational attainment of the current workforce in the selected occupations.

Exhibit 11. California educational attainment for medical imaging-related occupations, 2021



⁷ Employers may include more than one level of experience as a hiring requirement in a job posting. As a result, the values in exhibit 9 may sum to greater than 100%.

The U.S. Bureau of Labor Statistics (BLS) uses a categorical system to assign typical entry-level education and job requirements to each occupation for which the BLS publishes projection data. These categories include entry-level education, work experience in a related occupation, and on-the-job training. Exhibit 12 shows the typical entry-level job requirements for each occupation included in this report.

Exhibit 12. Typical entry-level job requirements

Occupation	Entry-level Education Requirements	Work Experience Requirements	On-The-Job Training Requirements
Radiologic Technologists and Technicians	Associate degree	None	None
Diagnostic Medical Sonographers	Associate degree	None	None
Magnetic Resonance Imaging Technologists	Associate degree	Less than five years	None

EDUCATIONAL SUPPLY

Educational supply for an occupation can be estimated by analyzing the number of awards issued in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes. Exhibit 13 shows the TOP and CIP codes for educational programs related to the three medical imaging-related occupations included in this report.

Exhibit 13. TOP and CIP codes for training programs related to medical imaging

TOP Programs and Codes	Aligned CIP Programs and Codes
Radiologic Technology (1225.00)	Radiologic Technology/Science – Radiographer (51.0911)
Diagnostic Medical Sonography (1227.00)	Diagnostic Medical Sonography/Sonographer and Ultrasound Technician (51.0910)
	Magnetic Resonance Imaging (MRI) Technology/Technician (51.0920)

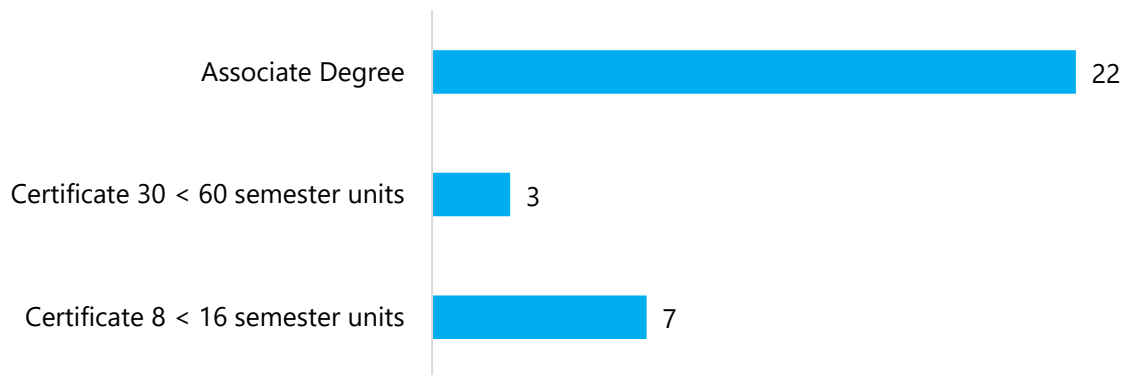
Community College Supply

Exhibits 13 and 14 compare the average number of certificates and degrees from the selected Greater Sacramento Community College programs over the last three academic years. Three community colleges in the subregion awarded an average of 32 awards in the previous three academic years.

Exhibit 13. Annual average community college awards by program

Program - TOP Code	College	Annual Awards 2019-20	Annual Awards 2020-21	Annual Awards 2021-22	3-Yr Annual Awards Average
Radiologic Technology (1225.00)	Folsom Lake	-	10	12	7
	Yuba	15	26	17	19
	Subtotal	15	36	29	27
Diagnostic Medical Sonography (1227.00)	Cosumnes River	-	-	16	5
	Subtotal	-	-	16	5
	Grand Total	15	36	45	32

Exhibit 14. Annual average community college awards by type, 2019-20 through 2021-22



Other Postsecondary Supply

Exhibit 15 compares the average number of degrees that non-community college training providers conferred in the Greater Sacramento subregion over the last three academic years. Please note that non-community college data lags by one year.

Exhibit 15. Other postsecondary awards by program

Program - CIP Code	Institution	Annual Awards 2019-20	Annual Awards 2020-21	2-Yr Annual Awards Average
Diagnostic Medical Sonography/Sonographer and Ultrasound Technician (51.0910)	National Career Education	8	-	4
	Sacramento Ultrasound Institute	7	10	9
	Subtotal	15	10	13
Magnetic Resonance Imaging (MRI) Technology/Technician (51.0920)	Sacramento Ultrasound Institute	4	3	4
	Subtotal	4	3	4
	Grand Total	19	13	16

FINDINGS

This report focuses on the following three medical imaging-related occupations: Diagnostic Medical Sonographers (29-2032), Radiologic Technologists and Technicians (29-2034), and Magnetic Resonance Imaging Technologists (29-2035).

Occupational Demand

- The Greater Sacramento subregion held 2,262 jobs for the three medical imaging-related occupations in 2022. These jobs are projected to increase by 14% over the next five years, adding 316 new jobs to the subregion by 2027.
- Jobs for the occupations included in this report are projected to grow slightly faster in the Greater Sacramento subregion (14%) than in California (13%).
- Over the next five years, medical imaging-related occupations are projected to have 195 annual job openings in the Greater Sacramento subregion.

Wages

- Entry-level (25th percentile) wage data shows that the occupations included in this report earn \$38.28 to \$47.41 per hour, which is above the subregion's living wage of \$18.72 per hour. (See Appendix B for notes about the updated living wage).

Job Postings

- In the last 12 months, 995 job postings were posted online for the three medical imaging-related occupations.
- Though more than half of job postings come from employers in Sacramento County, another 8% (n = 73) come from employers in El Dorado and Nevada counties. It will be essential to ensure healthcare providers in rural communities are considered partners in community college medical imaging pathways.
- Analysis of job titles highlights local employers' need for certain types of training (Appendix C). Potential areas of focus within medical imaging include:
 - Radiologic technology: Computed tomography, x-ray, mammography, and, to a lesser extent, interventional radiology.
 - Sonography: ultrasound and cardiovascular.
 - Other specialties include radiation therapy and PACS system administrators.

Education and Training Requirements

- The typical entry-level education for each occupation included in this report is an associate degree. Additionally, 45% to 66% of incumbent workers in the studied occupations have educational attainment levels consistent with community college offerings (some college or associate degrees).

Postsecondary Supply

- Three Greater Sacramento community colleges offer degrees and certificates in programs aligned to the occupations of interest. These programs conferred an average of 32 awards (certificates and associate degrees) in Radiologic Technology and Diagnostic Medical Sonography programs over the last three academic years.
- Local non-community college postsecondary training providers also offer training related to the studied occupations. Between 2019-20 and 2020-21, non-community college training providers conferred an average of 16 awards in relevant programs over the last three years. Please note that non-community college awards data often lags by one year.

RECOMMENDATIONS

- Based on a comparison of annual openings to average annual awards in the Greater Sacramento subregion, there seems to be an undersupply between educational supply and occupational demand.
 - Three community colleges (Cosumnes River, Folsom Lake, and Yuba) in the Greater Sacramento subregion issued an average of 32 awards over the last three years (2019-21 to 2021-22).
 - There are 195 projected annual openings for the three medical imaging-related occupations included in this report.
- The North (Greater Sacramento) Center of Excellence recommends developing a new medical imaging program and making modifications (substantial changes) to existing programs.
- The North (Greater Sacramento) Center of Excellence recommends expanding existing community college programs to meet local demand, primarily since only nine (9) community colleges in Northern California have conferred awards in the last three years.

New Program Recommendation		
Move forward with the new program	Proceed with caution	A new program is not recommended
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Program Modification	
Move forward with program modifications	Program modifications are not recommended
<input checked="" type="checkbox"/>	<input type="checkbox"/>

APPENDIX A. METHODOLOGY AND SOURCES

This report identified Occupations using the Center of Excellence TOP-to-CIP-to-SOC crosswalk and O*Net OnLine. This report's findings were determined using labor market data from the Bureau of Labor Statistics (BLS), U.S. Census Bureau data from Emsi, and jobs posting data from Burning Glass.

"The Chancellor's Office Curriculum Inventory System (COCI)." California Community Colleges Curriculum Inventory (COCI), 2023. <https://coci2.ccctechcenter.org/>.

Glasmeier, Amy K. "Living Wage Calculator." Living Wage Calculator, 2023. <https://livingwage.mit.edu/>.

Integrated Postsecondary Education Data System (IPEDS). National Center for Education Statistics. U.S. Department of Education. <https://nces.ed.gov/ipeds/>.

Labor Market Information Division. California Employment Development Department. <https://labormarketinfo.edd.ca.gov/>.

Lightcast (Formerly EMSI/Burning Glass) 2023.3; QCEW Employees, Non-QCEW Employees, and Self-Employed. <https://www.economicmodeling.com/>. (Note: EMSI occupational employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors)).

Management Information Systems (MIS) Data Mart. California Community Colleges Chancellor's Office. <https://datamart.cccco.edu/>.

O*NET OnLine. U.S. Department of Labor/Employment and Training Administration (DOL ETA). <https://www.onetonline.org/>.

Self-Sufficiency Standard Tool for California. The University of Washington. <http://www.selfsufficiencystandard.org/>

"Taxonomy of Programs." California Community Colleges Chancellor's Office. June 2012, 6th Edition. <https://www.cccco.edu/-/media/CCCCO-Website/About-Us/Divisions/Educational-Services-and-Support/Academic-Affairs/What-we-do/Curriculum-and-Instruction-Unit/Files/TOPmanual6200909corrected12513pdf.ashx>

"TOP-CIP-SOC Crosswalk." Centers of Excellence for Labor Market Research. June 2021 Edition. <http://coecc.net/>

APPENDIX B. GLOSSARY

Key Terms	Definition
Occupation	<p>Occupation refers to a category of jobs, careers, or professions that are similar regarding the work performed and the skills the workers possess. Workers who perform essentially the same tasks are in the same occupation, whether in the same industry. Some occupations are concentrated in a few industries, while others are found in many industries.</p> <p>Occupations differ from jobs in that jobs show the number of positions held in each occupation.</p>
Jobs	<p>A job is a specific instance of employment and includes any position where a worker provides labor for monetary compensation.</p> <p>Job numbers include employees (those who work for businesses) and proprietors (those who work for themselves). Full- and part-time jobs are included and counted equally (i.e., not adjusted to full-time equivalents). Data for jobs, or employment, are annual averages.</p>
Employment	<p>Employment refers to filled jobs, whether full- or part-time, temporary or permanent. The scope of "who" is counted as employed is noted in Appendix A. Methodology and Sources.</p>
Job Change	<p>Job change is the net increase or decrease of jobs over a given timeframe.</p>
Job Opening	<p>Job openings are the projected number of positions available for workers entering an occupation.</p> <p>Openings include growth and replacement job counts. Growth job counts are the positive change in the total number of workers employed. Replacement job counts are the estimates of new workers needed to replace workers permanently leaving the occupation.</p>
Percentile Wage (or wages)	<p>A percentile wage is the value of a wage at which a certain percentage of workers falls below. For example, a 25th percentile hourly wage of \$15.00 indicates that 25% of workers earn less than \$15.00, while 75% earn more. Percentile wages are specific to the geography shown in the report.</p> <p>The 25th-percentile and 75th-percentile hourly wages are used as a proxy for entry-level and experienced-level wages.</p>
Living Wage	<p>The living wage is the level of income a single, working adult with no children must earn to meet basic needs. The living wage is calculated using basic allowances for food, housing, transportation, healthcare, taxes, and other miscellaneous basic needs, and assumes full-time employment (40 hours per week, 52 weeks a year).</p> <p>Beginning in 2023-24, NFN COE adopted the MIT calculations for a living wage better aligned to the economic conditions following the pandemic. For additional information, please visit https://livingwage.mit.edu/.</p>

Key Terms	Definition
Educational Attainment	Educational attainment is the highest level of education achieved by workers in an occupation. The data include workers aged 25 years and older.
Typical Entry-level Education	<p>The education level most workers need to gain employment in an occupation. Categories range from "no formal educational credential" and "high school diploma or equivalent" to "doctoral or professional degree." The types most relevant to community training are "some college, no degree," "postsecondary nondegree award," and "associate degree."</p> <p>The typical entry-level education may differ from the actual educational levels attained by workers employed in an occupation.</p>
Typical Work Experience	The relevant prior experience a worker needs to gain employment in an occupation. Categories include "5 years or more", "less than five years," and "none."
Typical On-The-Job (OTJ) Training	The level of on-the-job training a worker needs to obtain for competency in the skills required for an occupation. Categories include "none," "short-term (1 month or less)," "moderate-term (more than one month but less than 12 months)," "long-term (more than 12 months)," "apprenticeship," and "internship/residency."
Awards	Awards are the number of certificates and degrees conferred for a specific course of study each year. Awards count "papers" and, as a result, may be greater than the number of students who complete a program.

APPENDIX C. MEDICAL IMAGING SPECIALTIES

Table C1 summarizes medical imaging specialties found in the job postings through an analysis of job titles. The table below suggests some focus areas for community college programs and should be verified through conversations with employers. Please note that sums of values may not match the number of job postings in each area due to double counting.

Specialty	Number of Postings
Radiology	
Computed Tomography (CT)/PET	135
X-Ray	82
Travel/Mobile	76
Mammography	53
Interventional Radiology	38
Sonography	
Ultrasound	78
Cardiac/Vascular	50
Travel	9
Perinatal	2
Magnetic Resonance Imaging	
Travel	12
CT/MRI	7
Other	
Radiation Therapy	9
PACS System Administrators	2

Funding Acknowledgement: This report was made available with Strong Workforce Program funding from the North Far North Regional Consortium.

COVID-19 Statement: This report includes employment projection data produced by Lightcast (formerly EMSI). Employment projections are developed using models based on historical data, which in this set of projections covers the period through 2021. Most input data, therefore, precedes the pandemic. Employment projections are long-term projections intended to capture structural changes in the economy, not cyclical fluctuations. As such, projections data are not intended to capture the impacts of the recession that began in February 2020. Cyclical fluctuations, like recessions, impact projections when they become part of the historical data set.

Important Disclaimer: All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. Efforts have been made to qualify and validate the accuracy of the data and the reported findings; however, neither the Centers of Excellence, COE host District, nor California Community Colleges Chancellor's Office are responsible for applications or decisions made by recipient community colleges, or their representatives based upon components or recommendations contained in this study.

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Centers of Excellence for Labor Market Research, Economic and
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CENTERS OF EXCELLENCE
FOR LABOR MARKET RESEARCH

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