
MANDATED BENEFIT REVIEW OF
HOUSE BILL 2978
SUBMITTED TO THE 191ST GENERAL COURT:

**AN ACT PROVIDING INSURANCE COVERAGE
FOR BIENNIAL ECHOCARDIOGRAM
AND CONCUSSION ANALYSIS
FOR PERSONS UNDER THE AGE OF 18**

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1.0 Benefit Mandate Overview: House Bill (H.B.) 2978: An Act providing insurance coverage for biennial echocardiogram and concussion analysis for persons under the age of 18.

1.1 History of the Bill

The Committee on Financial Services referred H.B. 2978, “An Act providing insurance coverage for biennial echocardiogram and concussion analysis for persons under the age of 18,”¹ to the Center for Health Information and Analysis (CHIA) for review. Massachusetts General Laws (MGL) Chapter 3 §38C requires CHIA to review and evaluate the potential fiscal impact of each mandated benefit bill referred to the agency by a legislative committee. The report is required to include the effects on the cost of health care, including the premium and administrative expenses, of the proposed mandate.

This report is not intended to determine whether H.B. 2978 would constitute a health insurance benefit mandate for purposes of state defrayal under the Affordable Care Act, nor is it intended to assist with state defrayal calculations if it is determined to be a health insurance benefit mandate requiring state defrayal.

1.2 What Does the Bill Propose?

Massachusetts H.B. 2978, as submitted in the 190th General Court of the Commonwealth of Massachusetts (Commonwealth), requires carriers to provide coverage of biennial echocardiograms and concussion analyses for persons between the ages of 5 and 18.

Subsequent to referral of the bill to CHIA for review, CHIA and its consultants submitted an inquiry to the sponsoring legislator and staff to clarify the bill’s intent. The sponsor clarified the following:

1. The inclusion of the phrase “coverage for cancer chemotherapy treatment” is a drafting error, and as such, was not considered in this report
2. The bill’s intent is to cover “complete” rather than “limited” echocardiogramsⁱ
3. The bill does not include electrocardiograms (EKGs or ECGs)
4. The bill is intended to cover all asymptomatic persons between the ages of 5 and 18 who participate in sports

1.3 Medical Efficacy of S.B. 2978

Project Play, an initiative of the Aspen Institute, a Washington, D.C. think tank, estimates that 71.5% of children aged 6-12 participated in a team or individual sport, either organized or unorganized, in 2016 in the United States.² The Centers for Disease Control’s (CDC’s) annual Youth Risk Behavior Surveillance report estimated that 54.3% of high

ⁱ The difference between a “complete” and “limited” echocardiogram is that a “complete” echocardiogram studies defined anatomical structures. These include: left atrium, right atrium, left ventricle, right ventricle, aortic valve, mitral valve, tricuspid valve, pericardium, adjacent portions of aorta, and pulmonic valve.

school students played on at least one sports team in 2017.³ H.B. 2978 would require coverage of a biennial echocardiogram and concussion analysis for each of these persons.

An echocardiogram (echo) is a noninvasive ultrasound of the heart that, among other things, can detect structural abnormalities that may contribute to sudden cardiac death (SCD).⁴ Due to the rarity of cardiac defects in children, the expense of the test, and potential for false-positive results, most experts do not recommend echos for asymptomatic children.^{5,6}

A concussion is a type of traumatic brain injury. Several modalities of concussion analysis may be performed in a medical or non-medical setting. Baseline testing of children involved in physical activity or organized sports provides a comparison point in the event of a concussion injury. Since there are no risks involved in the testing, experts support widespread baseline screening.

1.4 Current Coverage

BerryDunn surveyed 10 insurance carriers in the Commonwealth, and 5 responded. None of the five responding insurers provide coverage of echo and concussion analysis for asymptomatic children.

1.5 Cost of Implementing the Bill

Requiring coverage for this benefit by fully insured health plans would result in an average annual increase, over five years, to the typical member's monthly health insurance premium of between \$0.12 and \$1.09 per member per month (PMPM) or between 0.021% and 0.198% of premium. The impact on premiums is driven by the cost of adding coverage for echo and concussion analysis for asymptomatic children.

1.6 Plans Affected by the Proposed Benefit Mandate

H.B. 2978 applies to commercial fully insured health insurance plans, hospital service corporations, medical service corporations, HMOs, and to both fully and self-insured plans operated by the Group Insurance Commission (GIC) for the benefit of public employees.

1.7 Plans Not Affected by the Proposed Benefit Mandate

Self-insured plans (i.e., where the employer or policyholder retains the risk for medical expenses and uses a third-party administrator or insurer to provide only administrative functions), except for those provided by the GIC, are not subject to state-level health insurance mandates. State mandates do not apply to Medicare and Medicare Advantage plans or other federally funded plans, including TRICARE (covering military personnel and dependents), the Veterans Administration, and the Federal Employee's Health Benefit Plan, the benefits for which are determined by or under rules set by the federal government. Thus, this analysis excludes members over 64 years of age with commercial fully insured plans.

2.0 Medical Efficacy Assessment

H.B. 2978, as submitted in the 190th General Court, would require fully insured plans to provide coverage for biennial echo and concussion analysis for persons between the ages of 5 and 18.⁷

MGL Chapter 3 §38C charges the Commonwealth's CHIA with reviewing the medical efficacy of proposed mandated health insurance benefits. Medical efficacy reviews summarize current literature on the effectiveness and use of the mandated treatment or service, and describe the potential impact of a mandated benefit on the quality of patient care and health status of the population.

The report proceeds in the following sections:

Section 2: Medical Efficacy Assessment

- **Section 2.1** describes the purpose and efficacy of an echo to detect risk factors for SCD
- **Section 2.1.1** provides the pathophysiology, incidence, and prevalence of SCD
- **Section 2.1.2** details other medical tests that can be used to detect SCD
- **Section 2.2** provides a description of “concussion analysis” as it pertains to the bill
- **Section 2.2.1** provides the pathophysiology, incidence, and prevalence of concussions in the relative population
- **Section 2.2.2** discusses the efficacy of concussion analysis

2.1 Echocardiogram (Echo)

An echo is a test that uses sound waves to create pictures of the heart's chambers, valves, walls, and the blood vessels (aorta, arteries, and veins) attached to the heart.⁸ A probe called a transducer is passed over the chest.⁹ The transducer creates sound waves that bounce off of the heart and “echo” back to it.¹⁰ The sound waves are changed into pictures that can be viewed on a video monitor. The test is noninvasive, and there are no known risks.¹¹ The test is not painful and causes no side effects.¹² An echo provides information about the heart's structure and how well it functions.¹³ Echos can identify hypertrophic cardiomyopathy (HCM), which is a leading cause of SCD in young people—often in young athletes¹⁴—although a negative echo does not completely rule out HCM.¹⁵ Echos can also detect structural abnormalities of the heart, which can also cause SCD.¹⁶ Echos do not detect electrical disturbances, which can also lead to SCD (e.g., Wolf Parkinson White syndrome [WPW]).

The first appropriate use criteria (AUC) for outpatient pediatric echocardiography were published in 2014 by the American College of Cardiology in conjunction with the American Academy of Pediatrics, the American Heart Association (AHA), and seven other medical societies. The criteria sought to provide guidelines for pediatric cardiologists, as well as pediatricians and family practitioners, as to when and how often pediatric echos are appropriate.¹⁷ The AUC recommend using echos in children with palpitations who have a family history of cardiomyopathy or sudden cardiac arrest under the age of 50, and children with an ECG result that indicates supraventricular or ventricular tachycardia. The AUC do not indicate using echo for asymptomatic children without a family history of cardiovascular disease.

Because of the low incidence rate of cardiovascular disease in children, the AHA's guidelines for prescreening of young athletes do not include ECGs, echos, or other tests. Instead, the AHA recommends less expensive and less intensive screenings, such as personal history, family history, and a physical examination. If the results of these first-line screenings indicate a higher risk, then the AHA recommends more-intensive testing modalities.¹⁸ Appendix A describes the 14 screening elements recommended by the AHA for preparticipation cardiovascular screening of young competitive athletes.

2.1.1 SCD

SCD is an unexpected death due to loss of heart function, typically occurring less than one hour from the onset of symptoms.¹⁹ Adults in their mid-30s to mid-40s are most susceptible, and men are twice as likely as women to be affected.²⁰ SCD is the leading cause of natural death in the United States, killing approximately 325,000 adults every year and accounting for half of all heart disease deaths.²¹

According to the AHA, SCD is the leading non-traumatic cause of death among young athletes. These deaths may be due to a congenital or acquired cardiovascular malformation, and strenuous athletics may contribute to the progression of cardiovascular disease and even trigger SCD in susceptible individuals.²²

There is no consensus on the incidence of SCD among youth athletes; the AHA notes that estimates range from 1 in 23,000 to 1 in 300,000, making it very rare.²³ The Cleveland Clinic also describes SCD as rare in children, estimating it affects 1 to 2 children per 100,000 per year.²⁴

While incidence of pediatric cardiomyopathy in particular is low, it is a frequent cause of sudden cardiac arrest, and thus SCD, in children, according to the National Heart, Lung, and Blood Institute. CDC research indicates that children and young adults with congenital HCM are at high risk of SCD.²⁵ The AHA's Pediatric Cardiomyopathy Registry shows that 1 in 100,000 children under age 18 have been diagnosed with some form of cardiomyopathy. The majority are diagnosed under 12 months of age or between the ages of 12 and 18.²⁶

Research utilizing 27 years of data on young athletes in 38 different sports identified 1,049 children who died from SCD, with an average of 66 deaths per year in the final 6 years studied. Researchers further found that over half of SCD deaths were due to cardiovascular disease and that 54% occurred in high school students; 82% occurred during strenuous activity while training or competing.²⁷

The rarity of SCD in children further presents obstacles to large-scale studies of screening methods. Very large numbers of subjects have to be studied in order to draw statistically valid conclusions about the efficacy of screening tests. The frequency of diagnostic errors is also higher in pediatric echos than adult echos. A 2008 study of diagnostic errors in pediatric echos found that 60% of these errors were false negatives.²⁸

2.1.2 Additional Screening Tests for SCD

An electrocardiogram (ECG, sometimes called an EKG) is a test that measures the electrical impulses that cause the heart to beat. It is painless and can be done quickly in a doctor's office, using 12 electrodes that stick to the chest and sometimes the limbs. The test records how long it takes the electrical impulses to pass from one part of the heart to the next, and the amount of electrical activity that is passing through the heart muscle. The results can be used to determine if parts of the heart are too large or working too hard, or to uncover WPW syndrome, a deadly heart rhythm that causes SCD.²⁹

A large-scale study of ECGs in over 32,000 Chicago-area high school students over three years found abnormal results requiring follow up in 2.5% of students.³⁰ However, ECGs can have high false-positive rates, as much as 40% in an Italian study of young adult athletes.³¹ The authors of the Italian study concluded that this demonstrated a significant limitation on ECG as a prescreening tool, because intense exercise can change the heart. Further, a high rate of false positives might lead to unnecessary emotional and financial burdens on affected patients who undergo additional testing.

The ECG only captures activity during the test and may not record abnormal rhythms that come and go. Other tests include:

- **Holter monitor:** A wearable device that performs like a continuous ECG, worn for 24 to 48 hours
- **Event monitor:** Similar to a Holter monitor, this device is activated by the wearer when symptoms occur and captures a few minutes of data at a time over the course of 30 days
- **Stress test:** An ECG performed while the patient is walking on a treadmill or riding a stationary bike
- **Implantable loop recorder:** This test is also similar to a Holter monitor, but the device is implanted under the skin and can be left in place for three years.³²

2.2 Concussion Analysis

The term "concussion analysis" can refer to several types of tests. Sponsors clarified to BerryDunn that the intent of the mandate is to cover baseline testing for children participating in sports activities, the results of which can be compared later to tests given after a suspected concussion. BerryDunn has thus focused this efficacy review on baseline tests.

Baseline testing measures the child's balance and brain function (including learning and memory skills, ability to pay attention or concentrate, and how quickly he or she thinks and solves problems), as well as for the presence of any concussion symptoms.³³ Types of testing are described in Section 2.2.2.

In an asymptomatic child, baseline concussion testing may be bundled in a standard risk assessment.³⁴ This makes it more challenging to identify current utilization and coverage of baseline concussion testing in claims available in the Massachusetts All Payer Claim Database (MA APCD).

2.2.1 Concussion

A concussion is a form of traumatic brain injury. The American Association of Neurological Surgeons (AANS) describes a concussion as "a clinical syndrome characterized by immediate and transient alteration in brain function,

including alteration of mental status and level of consciousness, resulting from mechanical force or trauma.”³⁵ Injury to the brain can create chemical changes that stretch or damage cells.³⁶ Concussion often affects the patient’s short-term memory about the injury itself and may affect speech, balance, and muscle coordination. Symptoms usually resolve within 10 days.³⁷ The AANS notes that while a single concussion generally does not cause permanent damage, a second concussion in short succession of the first can cause permanent disability.

Signs of concussion include confusion, impaired motor function and concentration, headaches, and nausea. Athletes sustaining a concussion may lose consciousness at the time of the injury, but not losing consciousness is not an indication that no concussion has occurred.³⁸ Longer-term impacts, commonly called “Post-Concussion Syndrome,” can be permanent. They include fatigue, headaches, deficits in memory and problem solving, and decreased academic performance.

The CDC’s annual Youth Risk Behavior Surveillance project surveyed 15,000 high school students in 144 schools for its 2017 report. The report estimated that 15.1% of high school students had a concussion from playing sports or being physically active in the prior 12 months.³⁹

A 2010 study in *Pediatrics* estimated that 8- to 19-year-olds visited the emergency department (ED) 502,000 times for concussion between 2001 and 2005. Approximately half of these visits were sports-related and about 35% occurred in 8- to 13-year-olds. Within this younger age group, about one quarter of ED visits for sports-related concussions (SRC) occurred during organized team sports (OTS). Using population statistics, researchers then estimated that about 4 in 1,000 children aged 8 to 13 and 6 in 1,000 aged 14 to 19 had ever had an ED visit for an SRC, and that 1 in 1,000 children aged 8 to 13 and 3 in 1,000 aged 14 to 19 sustained these injuries during OTS. The authors of the study further found that although participation in OTS declined from 1997 to 2007, ED visits for concussions from OTS doubled in 8- to 13-year-old children, and more than doubled in 14- to 19-year-olds during those 10 years.⁴⁰ It is important to note that this increase may be the result of an increase in public awareness of the frequency and long-term consequences of concussion injuries in children, leading to more ED visits.

There is significant variation in concussion rates among different sports, according to a meta-analysis of 13 studies of 12 sports.⁴¹ Researchers found the highest incidence of concussion in rugby, hockey, and football. The lowest rates were found in volleyball, baseball, and cheerleading.

2.2.2 Screening Efficacy

Loss of memory or amnesia immediately following a concussion is the most predictive factor of the severity of impact on brain function, according to a study of high school and college athletes by the University of Pittsburgh Medical Center.⁴² Research into computerized neurocognitive testing of student athletes found that when schools use computerized testing on athletes who have sustained a concussion, the athletes usually spend a longer time away from play, which is shown to improve overall outcomes in concussion patients.⁴³

The Sport Concussion Assessment Tool (SCAT5) is one of several free tools for concussion evaluation that can be performed by a health care professional. Originally published in the *British Journal of Sports Medicine*, it was most recently updated in 2017. Two versions are available, one for assessing students aged five to 12 (Child SCAT5), and another for students aged 13 to 18 (SCAT5). The test can be administered at the beginning of athletic activities as a baseline test for post-injury comparison, or simply used to help diagnose concussion after an injury.⁴⁴ A 2017

consensus statement by the International Concussion in Sport Group praised the SCAT5 as “the most well-established and rigorously developed instrument available for sideline assessment.”⁴⁵

ImPACT Applications, Inc. and King-Devick Technologies, Inc. both market assessment tools administered on an iPad. The tests can be utilized in both clinical and school settings to gather baseline and post-injury data to assess and manage concussion injuries.^{46,47}

According to the Aspen Institute, nationwide, only 30% of youth coaches have specified training in concussion management.⁴⁸ Several free training resources are available from national organizations related to youth sports.⁴⁹ Since 2011, Massachusetts law has required schools to provide annual training for coaches, school nurses, school and team physicians, certified athletic trainers, athletic directors, student athletes, and parents from grades 6 through 12. Massachusetts schools are required to develop procedures for managing the return-to-play decision when students experience a head injury while involved in athletics.⁵⁰

2.3 Conclusion

Given the low incidence of HCM and other heart defects in children (estimates range from 1 in 23,000 to 1 in 300,000), most experts do not recommend the use of echos to screen for SCD in asymptomatic children. Less intensive and less expensive screenings, such as reviewing the child’s personal and family histories and physical examination, the approach recommended by the AHA, are considered by experts to be a better way to identify children potentially at risk of SCD. Doctors may be reluctant to order significant testing for an asymptomatic child due to the expense and inconvenience to the family and lack of support in medical literature. Furthermore, these factors make it difficult to predict echo utilization in this population should this bill pass.

Baseline concussion analysis poses no risk to a child and has a low cost. Screening is readily available at no cost at many schools and can be obtained at a low cost in many pediatric practices. Baseline screening is widely supported by clinical experts as an effective means to assist with a diagnosis of concussion in the event of a head injury, assist in return-to-play determinations, and evaluate a child’s recovery progress. Given that an estimated 15.1% of Massachusetts high school students sustain a concussion over the course of a year, improved access to baseline concussion analysis, especially for children participating in organized team sports, would benefit a large number of children. To the extent that this mandate would provide increased coverage of baseline concussion screening, the legislation would provide valuable clinical information to contribute to the health of the bill’s intended population.

Appendix A

AHA-recommended elements for preparticipation cardiovascular screening of asymptomatic youth competitive athletes:ⁱⁱ

Medical History

Personal history

1. Chest pain/discomfort/tightness/pressure related to exertion

Unexplained syncope/near-syncope

Excessive exertional and unexplained dyspnea/fatigue or palpitations

Prior recognition of a heart murmur

Elevated systemic blood pressure

Prior restriction from participation in sports

2. Prior testing for the heart, ordered by a physician

Family history

3. Premature death (sudden and unexpected, or otherwise) before age 50 years

Disability from heart disease in a close relative <50 years of age

1. Hypertrophic or dilated cardiomyopathy, long-QT syndrome, or other ion channelopathies, Marfan syndrome, or clinically significant arrhythmias

Physical examination

4. Heart murmur

Femoral pulses to exclude aortic coarctation

Physical stigmata of Marfan syndrome

2. Brachial artery blood pressure (sitting position)

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Endnotes

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¹⁵ Opinion from expert at University of Massachusetts Medical School, 4 December 2018.

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- ⁴⁹ National Alliance for Youth Sports. Concussion Training. Accessed 1 November 2018
<https://www.nays.org/nyscaonline/preview/concussion-training.cfm>.
- ⁵⁰ 105 CMR 201.000: Head Injuries and Concussions in Extracurricular Athletic Activities Accessed 1 November 2018
<https://www.mass.gov/files/documents/2016/07/vg/105-cmr-201.pdf>.

**AN ACT PROVIDING INSURANCE COVERAGE
FOR BIENNIAL ECHOCARDIOGRAM
AND CONCUSSION ANALYSIS
FOR PERSONS UNDER THE AGE OF 18**

COST REPORT

1.0 Executive Summary

Massachusetts Senate Bill (H.B.) 2978, as submitted in the 190th General Court of the Commonwealth of Massachusetts (Commonwealth), requires fully-insured plans to cover biennial echocardiograms and concussion analyses for persons between the ages of five and eighteen.¹

Subsequent to referral of the bill to CHIA for review, CHIA and its consultants submitted an inquiry to the sponsoring legislator and staff to clarify the bill's intent. The sponsor clarified the following:

1. The inclusion of the phrase “coverage for cancer chemotherapy treatment” is a drafting error, and as such, was not considered in this report
2. The bill's intent is to cover “complete” rather than “limited” echocardiogramsⁱ
3. The bill does not include electrocardiograms (EKGs or ECGs)
4. The bill is intended to cover all asymptomatic persons between the ages of 5 and 18 who participate in sports

Massachusetts General Laws (MGL) c.3 §38C charges the Massachusetts Center for Health Information and Analysis (CHIA) with, among other duties, reviewing the potential impact of proposed mandated health care insurance benefits on the premiums paid by businesses and consumers. CHIA has engaged BerryDunnⁱⁱ to provide an actuarial estimate of the effect enactment of the bill would have on the cost of health insurance in the Commonwealth. The report is required to include the effects on the cost of health care, including the premium and administrative expenses, of the proposed mandate.

This report is not intended to determine whether H.B. 2978 would constitute a health insurance benefit mandate for purposes of state defrayal under the Affordable Care Act, nor is it intended to assist with state defrayal calculations if it is determined to be a health insurance benefit mandate requiring state defrayal.

1.1 Current Insurance Coverage

BerryDunn surveyed 10 insurance carriers in the Commonwealth and five responded. None of the five responding insurers cover echo and concussion analysis for asymptomatic children.

No Massachusetts state or federal law requires coverage of echo or concussion analysis in asymptomatic children. Under the federal Affordable Care Act (ACA), echo and concussion analysis are considered essential health benefits (EHB), and are required for coverage, but only when medically necessary.² The benefits are defined for Massachusetts according to the state's benchmark health plan, which do not specifically include testing for asymptomatic children.³

¹ The difference between a “complete” and “limited” echocardiogram is that a “complete” echocardiogram studies defined anatomical structures. These include: left atrium, right atrium, left ventricle, right ventricle, aortic valve, mitral valve, tricuspid valve, pericardium, adjacent portions of aorta, and pulmonic valve.

ⁱⁱ Formerly Compass Health Analytics, Inc.

1.2 Analysis

BerryDunn estimated the impact of H.B. 2978 by assessing the incremental impacts of two components:

- Incremental cost due to the requirement that insurers cover a biennial echo for children between the ages of 5 and 18 who participate in sports
- Incremental cost due to the requirement that insurers cover a biennial concussion analysis for children between the ages of 5 and 18 who participate in sports

The incremental cost of the echo provision is estimated using claims data from the Massachusetts All Payer Claims Database (APCD) to determine cost per service or “unit cost” for this service. The incremental cost of the concussion analysis provision is estimated using publically available data to determine cost per service or “unit cost” for this service. The number of children anticipated to receive the screening services are estimated using population data and academic literature.

BerryDunn aggregated these components and projected them forward over the next five years (2020–2024) for the fully-insured Commonwealth population, using the bill’s effective date of January 1, 2020. Insurer retention (administrative cost and profit) was added to arrive at an estimate of the bill’s effect on premiums. Note the estimates assume carriers would fully comply with the provisions of the bill if it becomes law.

1.3 Summary Results

Table ES-1, on the following page, summarizes the estimated effect of H.B. 2978 on premiums for fully-insured plans over five years. This analysis estimates that the bill, if enacted as drafted for the General Court, would increase fully-insured premiums by as much as 0.198% on average over the next five years; a more likely increase is in the range of 0.097%, equivalent to an average annual expenditure of \$13.5 million over the period 2020–2024.

The impact on premiums is driven by the cost of adding coverage for echo and concussion analysis for asymptomatic children. The impact of the bill on any one individual, employer group, or carrier may vary from the overall results, depending on the current level of benefits each receives or provides, and on how those benefits would change under the proposed language of the bill.

The mid-scenario premium estimate at the midpoint of the five-year estimation period (2022) is \$0.47 PMPM or \$12.1 million annually for the echo testing provision, and \$0.05 PMPM or \$1.3 million for the concussion testing provision. The efficacy analysis for this bill finds that echo examinations of asymptomatic patients is not generally recommended, while baseline concussion testing is generally supported by clinical efficacy research.”⁴

Table ES-1: Summary Results

	2020	2021	2022	2023	2024	WEIGHTED AVERAGE	FIVE-YEAR TOTAL
Members (000s)	2,144	2,137	2,130	2,123	2,115		
Medical Expense Low (\$000s)	\$1,717	\$2,493	\$2,572	\$2,668	\$2,768	\$2,593	\$12,217
Medical Expense Mid (\$000s)	\$7,758	\$11,263	\$11,613	\$12,047	\$12,504	\$11,714	\$55,184
Medical Expense High (\$000s)	\$15,912	\$23,099	\$23,815	\$24,704	\$25,642	\$24,022	\$113,171
Premium Low (\$000s)	\$1,984	\$2,881	\$2,972	\$3,083	\$3,199	\$2,997	\$14,119
Premium Mid (\$000s)	\$8,966	\$13,016	\$13,421	\$13,921	\$14,450	\$13,537	\$63,773
Premium High (\$000s)	\$18,388	\$26,694	\$27,521	\$28,549	\$29,633	\$27,761	\$130,785
PMPM Low	\$0.11	\$0.11	\$0.12	\$0.12	\$0.13	\$0.12	\$0.12
PMPM Mid	\$0.49	\$0.51	\$0.53	\$0.55	\$0.57	\$0.53	\$0.53
PMPM High	\$1.00	\$1.04	\$1.08	\$1.12	\$1.17	\$1.09	\$1.09
Estimated Monthly Premium	\$516	\$531	\$547	\$563	\$580	\$548	\$548
Premium % Rise Low	0.021%	0.021%	0.021%	0.021%	0.022%	0.021%	0.021%
Premium % Rise Mid	0.095%	0.096%	0.096%	0.097%	0.098%	0.097%	0.097%
Premium % Rise High	0.194%	0.196%	0.197%	0.199%	0.201%	0.198%	0.198%

Executive Summary Endnotes

¹ The 190th General Court of the Commonwealth of Massachusetts, House Bill 2978, “An Act providing insurance coverage for biennial echocardiogram and concussion analysis for persons under the age of 18.” Accessed 28 September, 2018:

<https://malegislature.gov/Bills/190/H2978>.

² Centers for Medicare and Medicaid Services (CMS), Center for Consumer Information and Insurance Oversight, Information on Essential Health Benefits (EHB) Benchmark Plans. Accessed 11 July 2018: <https://www.cms.gov/ccio/resources/data-resources/ehb.html>.

³ CMS. Massachusetts State Required Benefits. Accessed 11 July 2018:

https://downloads.cms.gov/ccio/State%20Required%20Benefits_MA.PDF. Emergency Services: M.G.L.c.175§47U(e); M.G.c.176A§8U(e); M.G.L.c.176B§4U(e); M.G.L.c.176G§5(e). Mental health care: M.G.L.c.175§47B(g); M.G.L.c.176A§8A(g); M.G.L.c.176B§4A(g); M.G.L.c.176G§4M(g).

⁴ See H.B. 2978 Efficacy Report.

2.0 Introduction

The Committee on Financial Services referred House Bill (H.B.) 2978, “An Act providing insurance coverage for biennial echocardiogram (ECHO) and concussion analysis for persons under the age of 18,”¹ to the Center for Health Information and Analysis (CHIA) for review. Massachusetts General Laws (MGL), Chapter 3 §38C, requires CHIA to review and evaluate the potential fiscal impact of each mandated benefit bill referred to the agency by a legislative committee. The report is required to include the effects on the cost of health care, including the premium and administrative expenses, of the proposed mandate.

Assessing the impact of the proposed mandate on premiums entails analyzing its incremental effect on spending by insurance plans. This, in turn, requires comparing spending under the provisions of the bill to spending under current statutes and current benefit plans for the relevant services.

This report is not intended to determine whether H.B. 2978 would constitute a health insurance benefit mandate for purposes of state defrayal under the Affordable Care Act, nor is it intended to assist with state defrayal calculations if it is determined to be a health insurance benefit mandate requiring state defrayal.

Section 3.0 of this analysis outlines the provisions and interpretations of the bill. Section 4.0 summarizes the methodology used for the estimate. Section 5.0 discusses important considerations in translating the bill’s language into estimates of its incremental impact on health care costs and steps through the calculations. Section 6.0 discusses results.

2.1 Background

Massachusetts H.B. 2978, as submitted in the 190th General Court of the Commonwealth of Massachusetts (Commonwealth), requires carriers to provide coverage of biennial echos and concussion analyses for persons between the ages of five and eighteen.

Subsequent to referral of the bill to CHIA for review, CHIA and its consultants submitted an inquiry to the sponsoring legislator and staff to clarify the bill’s intent. The sponsor clarified the following:

1. The inclusion of the phrase “coverage for cancer chemotherapy treatment” is a drafting error, and as such, was not considered in this report
2. The bill’s intent is to cover “complete” rather than “limited” echocardiogramsⁱⁱⁱ
3. The bill does not include electrocardiograms (EKGs or ECGs)
4. The bill is intended to cover all asymptomatic persons between the ages of 5 and 18 who participate in sports

ⁱⁱⁱ The difference between a “complete” and “limited” echocardiogram is that a “complete” echocardiogram studies defined anatomical structures. These include: left atrium, right atrium, left ventricle, right ventricle, aortic valve, mitral valve, tricuspid valve, pericardium, adjacent portions of aorta, and pulmonic valve.

3.0 Interpretation of H.B. 2978

No Massachusetts state or federal law requires coverage of echo or concussion analysis in asymptomatic children. Under the federal Affordable Care Act (ACA), echo and concussion analysis are considered essential health benefits (EHB), and are required for coverage, but only when medically necessary.² The benefits are defined for Massachusetts according to the state's benchmark health plan, which do not specifically include testing for asymptomatic children.³

This report includes developing this cost of requiring coverage for the biennial echo and concussion analysis for asymptomatic children between the ages of 5 and 18 who participate in sports.

3.1 Plans Affected by the Proposed Mandate

The bill as drafted amends statutes that regulate health care carriers in the Commonwealth. The bill includes the following sections, each of which addresses statutes dealing with a particular type of health insurance policy:

- Section 1: Chapter 32A – Plans Operated by the Group Insurance Commission (GIC) for the Benefit of Public Employees
- Section 2: Chapter 175 – Commercial Health Insurance Company Plans
- Section 3: Chapter 176A – Hospital Service Corporation Plans
- Section 4: Chapter 176B – Medical Service Corporation Plans
- Section 5: Chapter 176G – Health Maintenance Organization (HMO) Plans

Self-insured plans, except for those managed by the GIC, are not subject to state-level health insurance benefit mandates. State mandates do not apply to Medicare or Medicare Advantage plans, the benefits of which are qualified by Medicare; this analysis excludes members of fully-insured commercial plans over 64 years of age and does not address any potential effect on Medicare supplement plans, even to the extent they are regulated by state law. This analysis does not apply to MassHealth.

3.2 Covered Services

BerryDunn surveyed 10 insurance carriers in the Commonwealth, and five insurers responded. None of the carriers responding currently covers the testing of asymptomatic children included in the proposed mandate. Five carriers did not respond to the survey.

3.3 Existing Laws Affecting the Cost of H.B. 2978

The proposed mandate is not redundant to or in conflict with any existing state or federal mandates.

4.0 Methodology

4.1 Overview

Estimating the impact of H.B. 2978 on premiums requires assessing the incremental impacts of two components:

- Incremental cost due to the requirement that insurers cover a biennial echo for children between the ages of 5 and 18 who participate in sports
- Incremental cost due to the requirement that insurers cover a biennial concussion analysis for children between the ages of 5 and 18 who participate in sports

The incremental cost of the echo provision is estimated using claims data from the APCD to determine cost per service or “unit cost” for this service. The incremental cost of the concussion analysis provision is estimated using publicly available data to determine cost per service or “unit cost” for this service. The number of children anticipated to receive the screening services are estimated using population data and academic literature. Combining the two components, and accounting for carrier retention, results in a baseline estimate of the proposed mandate’s incremental effect on premiums, which is projected over the five years following the assumed January 1, 2020 implementation date of the proposed law.

4.2 Data Sources

The primary data sources used in the analysis are:

- Information about the intended effect of the bill, gathered from sponsors
- Information, including descriptions of current coverage, from responses to a survey of commercial health insurance carriers in the Commonwealth
- The Massachusetts APCD
- Academic literature, published reports, and population data, cited as appropriate
- Discussion with various clinical experts and providers

4.3 Steps in the Analysis

To implement the analysis, BerryDunn performed the steps summarized in this section.

1. Estimated the number of children participating in sports

In order to estimate the number of children between the ages of five and 18 who participate in sports, BerryDunn:

- A. Used publically available data to determine the portion of children that participate in sports programs that would be eligible for the tests.
- B. Multiplied the portion of eligible children obtained in Step A by the total number of children in the commercial fully-insured population to estimate the number of children eligible to be tested.

2. Estimated marginal costs to insurers for biennial echo

In order to estimate the impact of the cost of biennial echo for children between the ages of five and 18 who participate in sports, BerryDunn:

- A. Used claims data from the APCD and determined the unit cost per service for an echo.
- B. Divided the eligible number of children from Step 1.B. by the number of life-years in the eligible age range, and multiplied by the anticipated number of tests over the entire 5-18 age range per eligible child, to estimate the annual number of children tested.
- C. Multiplied the estimated number of children tested from Step B by the unit cost in Step A to determine the incremental cost of the echo testing.
- D. Divided the incremental cost by the total corresponding membership to determine the incremental PMPM.
- E. Projected the baseline cost forward over the five-year analysis period using an estimated increase in professional services over the period.

3. Estimated marginal costs to insurers for biennial concussion analysis

In order to estimate the cost of biennial concussion analysis for children between the ages of five and 18 who participate in sports, BerryDunn:

- A. Used publically available data and determined the unit cost per service for concussion analysis.
- B. Divided the eligible number of children from Step 1.B. by two to convert to an annual number of eligible children, and multiplied the annual number of eligible children by the estimated utilization rate to estimate the annual number of children tested.
- C. Multiplied the estimated number of children tested from Step B by the unit cost in Step A to determine the incremental cost of testing.
- D. Divided the incremental cost by total corresponding membership to determine the incremental PMPM.
- E. Projected the baseline cost forward over the five-year analysis period using an estimated increase in professional services over the period.

4. Calculated the impact of the combined projected claim costs on insurance premiums

To add the other components of health insurance premiums to the estimated claims costs, BerryDunn:

- A. Summed the estimated incremental paid PMPM costs for echo and concussion analysis.
- B. Estimated the fully insured Commonwealth population under age 65, projected for the next five years (2020–2024).
- C. Multiplied the estimated aggregate incremental paid PMPM cost of the mandate by the projected population estimate to calculate the total estimated marginal claims cost of H.B. 2978.
- D. Estimated insurer retention (administrative costs, taxes, and profit) and applied the estimate to the final incremental claims cost calculated in Step C.

4.4 Limitations

Carriers do not currently provide coverage for asymptomatic echo testing and concussion analyses in Massachusetts, and the cost of concussion analyses could not be determined from APCD claims. BerryDunn was unable to find any publicly available literature studying the utilization of these services for asymptomatic children. In addition, the precise number of children ages five to 18 participating in sports in Massachusetts is unknown.

The more detailed step-by-step description of the estimation process outlined in the next sections addresses these uncertainties further.

5.0 Analysis

This section describes the calculations outlined in the previous section in more detail. The analysis includes development of a best estimate middle-cost scenario, as well as a low-cost scenario using assumptions that produced a lower estimate and a high-cost scenario using more conservative assumptions that produced a higher estimated cost impact.

Section 5.1 describes the steps used to calculate the number of children 5-18 who participate in sports. Section 5.2 describes the steps used to calculate the PMPM expenses associated with echo services. Section 5.3 describes the PMPM expenses for concussion analysis services. Section 5.4 aggregates the marginal PMPM costs. Section 5.5 projects the fully-insured population age 0–64 in the Commonwealth over the 2020–2024 analysis period. Section 5.6 calculates the total estimated marginal cost of H.B. 2978, and Section 5.7 adjusts these projections for carrier retention to arrive at an estimate of the bill's effect on premiums for fully-insured plans.

5.1 Sports Participation

Estimated the number of commercial fully insured children between the ages of 5 and 18 who participate in sports

BerryDunn used publicly available literature to determine the portion of children that participate in sports programs that would be eligible for biennial echo tests. Based on a 2017 report by the Aspen Institute,⁴ BerryDunn estimated that 71.5% of children between the ages of 5 and 12 participate in either a team or individual sport. To account for uncertainty, in the high scenario BerryDunn assumed 74.5% of children would participate in sports and in the low scenario that 68.5% would participate. BerryDunn multiplied the portion of children participating in sports by the total number of children between the ages of 5 and 12 in the 2016 commercial fully-insured population to estimate the number of children who are eligible for a biennial echo.

The CDC's Youth Risk Behavior Surveillance⁵ indicates that nationally 54.6% of high school age children participate in sports. The study provided participation rates by state; however, Massachusetts numbers were not available. The range of participation by state is between 47% and 63%. New Hampshire was the only New England state with participation rates included, and its participation rate was 61.5%, which is higher than the national average. BerryDunn assumed that Massachusetts would also be higher than the national average and used 60% as the estimated sports participation rate for children between the ages of 13 and 18 in the most likely scenario. In the high scenario, BerryDunn used a participation rate of 63%, and 57% was used in the low scenario. BerryDunn multiplied

the portion of children participating in sports by the total number of children between the ages of 13 and 18 in the 2016 commercial fully-insured population to estimate the number of children who are eligible for a biennial echo. BerryDunn added the number of children eligible for the testing from the two age categories to calculate the total number of children participating in sports and eligible for echo testing. Results are displayed in Table 1.

Table 1: Estimated Number of Children Participating in Sports

	AGES 5-12	AGES 13-18	TOTAL
Total Number of Fully-Insured Children	187,635	168,188	355,823
Percent of Children Participating in Sports			
Low Scenario	68.5%	57.0%	63.1%
Mid Scenario	71.5%	60.0%	66.1%
High Scenario	74.5%	63.0%	69.1%
Number of Children Participating in Sports			
Low Scenario	128,530	95,867	224,397
Mid Scenario	134,159	100,913	235,072
High Scenario	139,788	105,958	245,746

5.2 Echo

Estimated marginal costs to insurers to cover biennial echo for children between 5 and 18

H.B. 2978 requires insurers cover a biennial echo for children between 5 and 18 who participate in sports. BerryDunn used claims data from the APCD to determine the unit cost per service for an echo.

Currently carriers in Massachusetts do not cover echo for asymptomatic children. CPT Code 93306 is a complete, comprehensive echo and the most sensitive to rule out all causes of sudden cardiac death in a child.⁶ BerryDunn analyzed APCD data for this procedure code, calculated the total paid claims cost, and divided the paid claims cost by the corresponding number of claims to calculate the unit cost per claim. Results are displayed in Table 2.

Table 2: 2016 Echo Unit Cost

PAID CLAIM COST	NUMBER OF CLAIMS	UNIT COST PER CLAIM
\$2,580,363	5,207	\$496

Predicting utilization if the bill is enacted is challenging. BerryDunn anticipates utilization rates will be lower than available under the mandate. The current medical research does not support widespread echo screening in asymptomatic children, and few physicians recommend it. As the bill does not prohibit cost-sharing, and the cost of the service is material, parents may choose to forego the screening if their provider does not recommend it. In

addition, an echo is relatively time-consuming test to add to a preventive health regimen, taking approximately 40 minutes to perform.

No states have enacted similar legislation and BerryDunn was unable to find any available published statistics as to how many asymptomatic children get echo testing done. Given that the anticipated utilization rates will be relatively low, the mid scenario assumes that, on average, eligible children will get an echo test done once between the ages of 5 and 18. While not every child will have an echo test performed, it is likely some children will have more than one in this age range, averaging out to one per-child. The low scenario assumes that on average 20% of eligible children will get an echo test done once between the ages of 5 and 18. The high scenario assumes that on average eligible children will get an echo test done twice between the ages of 5 and 18. To determine the annual number of children tested, BerryDunn divided the total number of eligible children by the number of life-years included in the covered age range and multiplied by the average number of times each child will be tested over the entire age period. Table 3 displays the results.

Table 3: Estimated Annual Number of Children Tested

	ELIGIBLE NUMBER OF CHILDREN	AVERAGE NUMBER OF CHILDREN PER LIFE-YEAR	NUMBER OF TESTS PER ELIGIBLE CHILD	ANNUAL NUMBER OF CHILDREN TESTED
Low Scenario	224,397	16,028	0.20	3,206
Mid Scenario	235,072	16,791	1	16,791
High Scenario	245,746	17,553	2	35,107

Next BerryDunn multiplied the estimated number of children tested each year by the echo test unit cost per claim to determine the annual incremental cost of echo testing. Table 4 displays the results.

Table 4: Estimated Marginal Annual Cost of Echo

	2016	2020	2021	2022	2023	2024
Low Scenario	\$1,590,013	\$1,863,549	\$1,934,364	\$2,000,133	\$2,082,138	\$2,169,588
Mid Scenario	\$8,328,256	\$9,760,997	\$10,131,915	\$10,476,400	\$10,905,932	\$11,363,981
High Scenario	\$17,412,890	\$20,408,493	\$21,184,016	\$21,904,273	\$22,802,348	\$23,760,046

BerryDunn divided the annual incremental cost by the corresponding membership to estimate the incremental PMPM amount. This analysis used the long-term average national projection for cost increases to physical and clinical services over the study period.⁷ BerryDunn multiplied the incremental PMPM amounts by the trend factor to project the PMPM impact of requiring coverage for echos. Table 5 displays the results.

Table 5: Estimated Marginal PMPM Cost of Echo

	2016	2020	2021	2022	2023	2024
Low Scenario	\$0.06	\$0.07	\$0.08	\$0.08	\$0.08	\$0.09
Mid Scenario	\$0.33	\$0.38	\$0.40	\$0.41	\$0.43	\$0.45
High Scenario	\$0.68	\$0.80	\$0.83	\$0.86	\$0.89	\$0.93

5.3 Concussion Analysis

Estimated marginal costs to insurers to cover biennial concussion analysis for children between 5 and 18

The second component contributing to H.B. 2978's effect on premiums is the requirement that insurers cover biennial concussion analysis for children between 5 and 18 participating in sports.

Currently carriers in Massachusetts do not cover concussion analysis for asymptomatic children. In order to determine the concussion analysis unit cost per claim, BerryDunn first reviewed the costs per service in the APCD for procedure codes that were provided by the Massachusetts insurance carriers. However, none of the procedure codes aligned well with the proposed mandated benefits. As a result, BerryDunn used publically available data to determine the unit cost per service for concussion analysis. Pediatrics West practice in Massachusetts conducts concussion analysis base line testing for \$10 per service.⁸ Nationwide Services conduct a baseline concussion analysis for \$15 per service.⁹ Other providers offer concussion analysis within this range of cost per service. BerryDunn assumed the middle of the \$10 to \$15 range as the most likely cost per service scenario. As these units costs would represent carriers' allowed costs (before member cost share), BerryDunn multiplied the allowed unit cost by a ratio of paid claims costs to allowed claims costs derived from the APCD to calculate paid per claim unit cost. Results are displayed in Table 6.

Table 6: 2016 Concussion Analysis Unit Cost

	ALLOWED UNIT COST	ALLOWED TO PAID RATIO	PAID UNIT COST
Low Scenario	\$10.00	80%	\$8.00
Mid Scenario	\$12.50	80%	\$10.00
High Scenario	\$15.00	80%	\$12.00

In Section 5.1, BerryDunn calculated the number of children who participated in sports. The proposed mandate includes coverage for biennial concussion analysis. To estimate the annual number of children eligible to receive concussion analysis, BerryDunn divided the estimated number of children participating in sports (from Table 1) by 2. The results are displayed in table 7.

Table 7: Estimated Annual Number of Children Eligible for Testing

2016	
Low Scenario	112,199
Mid Scenario	117,536
High Scenario	122,873

Not all of the children who are eligible for testing will get the test done. There is currently concussion analysis testing available in some public schools in Massachusetts. Given the low cost of the test, and that it is currently available in some schools, it is reasonable to assume that the majority of children participating in sports will get a concussion analysis done. BerryDunn assumed that in the most likely scenario 75% of eligible children would be tested. In the high scenario, 100% of eligible children would be tested and 50% of eligible children would be tested in the low scenario. Given the low cost and medical support of widespread concussion testing, BerryDunn used conservative utilization assumptions. BerryDunn multiplied the annual number of children eligible for concussion analysis by the estimated utilization rate to estimate the annual number of children tested. Table 8 displays the results.

Table 8: Estimated Annual Number of Children Tested

	ELIGIBLE NUMBER OF CHILDREN	UTILIZATION RATE	ANNUAL NUMBER OF CHILDREN TESTED
Low Scenario	112,199	50%	56,099
Mid Scenario	117,536	75%	88,152
High Scenario	122,873	100%	122,873

Next BerryDunn multiplied the estimated number of children tested each year by the concussion analysis unit cost to determine the annual incremental cost of concussion analysis testing. Table 9 displays the results.

Table 9: Estimated Marginal Annual Cost of Concussion Analysis

	2016	2020	2021	2022	2023	2024
Low Scenario	\$448,794	\$524,269	\$545,043	\$566,640	\$589,093	\$612,436
Mid Scenario	\$881,519	\$1,029,766	\$1,070,570	\$1,112,992	\$1,157,094	\$1,202,944
High Scenario	\$1,474,479	\$1,722,445	\$1,790,697	\$1,861,653	\$1,935,421	\$2,012,112

BerryDunn divided the annual incremental cost by the corresponding membership to estimate the incremental PMPM amount. This analysis used the long-term average national projection for cost increases to physical and clinical services over the study period.¹⁰ BerryDunn multiplied the incremental PMPM amounts by the trend factor to project the PMPM impact of requiring coverage for concussion analysis. Table 10 displays the results.

Table 10: Estimated Marginal PMPM Cost of Concussion Analysis

	2016	2020	2021	2022	2023	2024
Low Scenario	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02
Mid Scenario	\$0.03	\$0.04	\$0.04	\$0.04	\$0.05	\$0.05
High Scenario	\$0.06	\$0.07	\$0.07	\$0.07	\$0.08	\$0.08

5.4 Marginal Cost Per Member Per Month

Adding together the estimated PMPM costs associated with the two relevant provisions (from Tables 5 and 10) yields the total PMPM marginal cost, shown in Table 11.

Table 11: Estimated Marginal PMPM Cost of ECHO and Concussion Analysis Mandate

	2020	2021	2022	2023	2024
Low Scenario	\$0.09	\$0.10	\$0.10	\$0.10	\$0.11
Mid Scenario	\$0.42	\$0.44	\$0.45	\$0.47	\$0.49
High Scenario	\$0.87	\$0.90	\$0.93	\$0.97	\$1.01

5.5 Projected Fully-Insured Population in the Commonwealth

Table 12 shows the fully-insured population in the Commonwealth ages 0 to 64 projected for the next five years. Appendix A describes the sources of these values.

Table 12: Projected Fully-Insured Population in the Commonwealth, Ages 0 – 64

YEAR	TOTAL (0 – 64)
2020	2,143,554
2021	2,137,204
2022	2,130,078
2023	2,122,832
2024	2,115,005

5.6 Total Marginal Medical Expense

Multiplying the total estimated PMPM cost by the projected fully-insured membership over the analysis period results in the total cost (medical expense) associated with the proposed requirement, shown on in Table 13. This analysis assumes the bill, if enacted, would be effective January 1, 2020.^{iv}

Table 13: Estimated Marginal Cost of ECHO and Concussion Analysis

	2020	2021	2022	2023	2024
Low Scenario	\$1,716,789	\$2,492,789	\$2,572,022	\$2,667,589	\$2,767,987
Mid Scenario	\$7,758,320	\$11,262,948	\$11,613,092	\$12,046,577	\$12,503,516
High Scenario	\$15,911,656	\$23,098,714	\$23,814,527	\$24,704,037	\$25,642,119

5.7 Carrier Retention and Increase in Premium

Carriers include their retention expense in fully-insured premiums. Retention expense includes general administration, commissions, taxes, fees, and contribution to surplus or profit. Assuming an average retention rate of 13.5% based on CHIA's analysis of fully-insured premium retention in the Commonwealth,¹¹ the increase in medical expense was adjusted upward to approximate the total impact on premiums. Table 14 shows the result.

Table 14: Estimate of Increase in Carrier Premium Expense

	2020	2021	2022	2023	2024
Low Scenario	\$1,983,986	\$2,880,762	\$2,972,327	\$3,082,768	\$3,198,791
Mid Scenario	\$8,965,811	\$13,015,892	\$13,420,532	\$13,921,485	\$14,449,540
High Scenario	\$18,388,117	\$26,693,755	\$27,520,977	\$28,548,928	\$29,633,011

^{iv} The analysis assumes the mandate would be effective for policies issued and renewed on or after January 1, 2020. Based on an assumed renewal distribution by month, by market segment, and by the Commonwealth market segment composition, 71.3% of the member months exposed in 2020 will have the proposed mandate coverage in effect during calendar year 2020. The annual dollar impact of the mandate in 2020 was estimated using the estimated PMPM and applying it to 71.3% of the member months exposed.

6.0 Results

The estimated impact of the proposed requirement on medical expense and premiums appears below. The analysis includes development of a best estimate “mid-level” scenario, as well as a low-level scenario using assumptions that produced a lower estimate and a high-level scenario using more conservative assumptions that produced a higher estimated impact.

The impact on premiums is driven by the provisions of H.B. 2978 that require that carriers cover biennial echo and concussion analysis for children between 5 and 18 when they participate in sports. Variation between scenarios is attributable to the uncertainty surrounding the utilization rate, and provider reimbursement for services by the carriers.

Starting in 2021, the federal ACA will impose an excise tax, commonly known as the “Cadillac Tax,” on expenditures on health insurance premiums and other relevant items (e.g., health savings account contributions) that exceed specified thresholds. To the extent that relevant expenditures exceed those thresholds (in 2021), H.B. 2978, by increasing premiums, has the potential of creating liability for additional amounts under the tax. Estimating the amount of potential tax liability requires information on the extent to which premiums, notwithstanding the effect of H.B. 2978, will exceed or approach the thresholds, and is beyond the scope of this analysis.

6.1 Five-Year Estimated Impact

For each year in the five-year analysis period, Table 15 (on the following page) displays the projected net impact of the proposed language on medical expense and premiums using a projection of Commonwealth fully-insured membership. Note that the relevant provisions of H.B. 2978 are assumed effective January 1, 2020.¹²

The low scenario impact is \$3.0 million per year on average and is based on an assumption that 63.1% of commercial fully-insured children will participate in sports and be eligible for testing. This scenario assumes that on average 20% of eligible children will have an echo performed once during ages five to 18 and that 50% of eligible children will have biennial concussion testing during those ages. The high scenario impact is \$27.8 M and is based on an assumption that 69.1% of commercial fully-insured children will participate in sports and be eligible for testing, and that, on average, eligible children will have an echo performed twice during the age period and all eligible children will have biennial concussion analyses performed. The middle scenario assumes that 66.1% of commercial fully-insured children will participate in sports and be eligible for testing and that, on average, eligible children will have one echo performed between the ages of five to 18 and 75% will have biennial concussion analyses performed. The middle scenario has average annual costs of \$13.5 million, or an average of 0.097% of premium.

The mid-scenario premium estimate at the midpoint of the five-year estimation period (2022) is \$0.47 PMPM or \$12.1 million annually for the echo testing provision, and \$0.05 PMPM or \$1.3 million for the concussion testing provision. The efficacy analysis for this bill finds that echo examinations of asymptomatic patients is not generally recommended, while concussion testing is generally supported by clinical efficacy research.”¹³

Finally, the impact of the proposed law on any one individual, employer group, or carrier may vary from the overall results, depending on the current level of benefits each receives or provides, and on how the benefits will change under the proposed language.

Table 15: Summary Results

	2020	2021	2022	2023	2024	WEIGHTED AVERAGE	FIVE-YEAR TOTAL
Members (000s)	2,144	2,137	2,130	2,123	2,115		
Medical Expense Low (\$000s)	\$1,717	\$2,493	\$2,572	\$2,668	\$2,768	\$2,593	\$12,217
Medical Expense Mid (\$000s)	\$7,758	\$11,263	\$11,613	\$12,047	\$12,504	\$11,714	\$55,184
Medical Expense High (\$000s)	\$15,912	\$23,099	\$23,815	\$24,704	\$25,642	\$24,022	\$113,171
Premium Low (\$000s)	\$1,984	\$2,881	\$2,972	\$3,083	\$3,199	\$2,997	\$14,119
Premium Mid (\$000s)	\$8,966	\$13,016	\$13,421	\$13,921	\$14,450	\$13,537	\$63,773
Premium High (\$000s)	\$18,388	\$26,694	\$27,521	\$28,549	\$29,633	\$27,761	\$130,785
PMPM Low	\$0.11	\$0.11	\$0.12	\$0.12	\$0.13	\$0.12	\$0.12
PMPM Mid	\$0.49	\$0.51	\$0.53	\$0.55	\$0.57	\$0.53	\$0.53
PMPM High	\$1.00	\$1.04	\$1.08	\$1.12	\$1.17	\$1.09	\$1.09
Estimated Monthly Premium	\$516	\$531	\$547	\$563	\$580	\$548	\$548
Premium % Rise Low	0.021%	0.021%	0.021%	0.021%	0.022%	0.021%	0.021%
Premium % Rise Mid	0.095%	0.096%	0.096%	0.097%	0.098%	0.097%	0.097%
Premium % Rise High	0.194%	0.196%	0.197%	0.199%	0.201%	0.198%	0.198%

6.2 Impact on the GIC

The proposed legislative change is assumed to apply to both fully-insured and self-insured plans operated for state and local employees by the GIC, with an effective date for all GIC policies on July 1, 2020.

Because the benefit offerings of GIC plans are similar to those of most other commercial plans in the Commonwealth, and based on our carrier surveys that did not indicate GIC had different coverage, the estimated incremental PMPM of the proposed legislative language on GIC medical expense is assumed not to differ from that calculated for the other fully-insured plans in the Commonwealth.

This is consistent with carrier survey responses that, in general, did not indicate differences in coverage for the GIC.

To estimate the medical expense separately for the GIC, the PMPM medical expense for the general fully-insured population was applied to the GIC membership starting in July of 2020.

Table 16 breaks out the GIC-only fully insured membership and the GIC self-insured membership, as well as the corresponding incremental medical expense and premium. Note that the total medical expense and premium values for the general fully-insured membership displayed in Table 15 also include the GIC fully-insured membership. Finally, the proposed legislative requirement is assumed to require the GIC to implement the provisions on July 1, 2020; therefore, the results in 2020 are approximately one-half of an annual value.

Table 16: GIC Summary Results

	2020	2021	2022	2023	2024	WEIGHTED AVERAGE	FIVE-YEAR TOTAL
GIC Fully-Insured							
Members (000s)	72	72	72	72	71		
Medical Expense Low (\$000s)	\$40	\$84	\$87	\$90	\$93	\$88	\$394
Medical Expense Mid (\$000s)	\$183	\$379	\$391	\$406	\$421	\$396	\$1,780
Medical Expense High (\$000s)	\$375	\$777	\$802	\$832	\$864	\$812	\$3,650
Premium Low (\$000s)	\$47	\$97	\$100	\$104	\$108	\$101	\$455
Premium Mid (\$000s)	\$211	\$438	\$452	\$469	\$487	\$457	\$2,057
Premium High (\$000s)	\$433	\$898	\$927	\$962	\$999	\$938	\$4,218
GIC Self-Insured							
Members (000s)	270	270	269	269	268		
Medical Expense Low (\$000s)	\$152	\$314	\$325	\$337	\$351	\$329	\$1,479
Medical Expense Mid (\$000s)	\$685	\$1,421	\$1,467	\$1,524	\$1,584	\$1,485	\$6,681
Medical Expense High (\$000s)	\$1,405	\$2,913	\$3,009	\$3,125	\$3,248	\$3,046	\$13,701

Endnotes

- ¹ The 190th General Court of the Commonwealth of Massachusetts, House Bill 2978, “An Act providing insurance coverage for biennial echocardiogram and concussion analysis for persons under the age of 18.” Accessed 28 September, 2018: <https://malegislature.gov/Bills/190/H2978>.
- ² Centers for Medicare and Medicaid Services (CMS), Center for Consumer Information and Insurance Oversight, Information on Essential Health Benefits (EHB) Benchmark Plans. Accessed 11 July 2018: <https://www.cms.gov/ccio/resources/data-resources/ehb.html>.
- ³ CMS. Massachusetts State Required Benefits. Accessed 11 July 2018: https://downloads.cms.gov/ccio/State%20Required%20Benefits_MA.PDF. Emergency Services: M.G.L.c.175§47U(e); M.G.c.176A§8U(e); M.G.L.c.176B§4U(e); M.G.L.c.176G§5(e). Mental health care: M.G.L.c.175§47B(g); M.G.L.c.176A§8A(g); M.G.L.c.176B§4A(g); M.G.L.c.176G§4M(g).
- ⁴ The Aspen Institute, State of Play 2017 Trends and Developments, Accessed 28 November, 2018: <https://assets.aspeninstitute.org/content/uploads/2017/12/FINAL-SOP2017-report.pdf>.
- ⁵ Centers for Disease Control and Prevention, Youth Risk Behavior Surveillance 2017, Accessed 28 November, 2018: <https://www.cdc.gov/healthyyouth/data/yrbs/pdf/2017/ss6708.pdf>.
- ⁶ Opinion from expert at University of Massachusetts Medical School: 4 December 2018.
- ⁷ U.S. Centers for Medicare and Medicaid Services (CMS), Office of the Actuary. National Health Expenditure Projections. Table 7, Physician and Clinical Services Expenditures; Aggregate and per Capita Amounts, Percent Distribution and Annual Percent Change by Source of Funds: Calendar Years 2010-2026; Private Insurance. Accessed 4 December 2018: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsProjected.html>.
- ⁸ Pediatrics West, Concussion Evaluation. Accessed 6 December 2018: <http://pediatricswest.com/concussion-evaluation/>.
- ⁹ Nationwide Children’s, Neurocognitive (Concussion) Baseline Testing. Accessed 6 December 2018: <https://www.nationwidechildrens.org/specialties/concussion-clinic/neurocognitive-concussion-baseline-testing>.
- ¹⁰ U.S. Centers for Medicare and Medicaid Services (CMS), Office of the Actuary. National Health Expenditure Projections. Table 7, Physician and Clinical Services Expenditures; Aggregate and per Capita Amounts, Percent Distribution and Annual Percent Change by Source of Funds: Calendar Years 2010-2026; Private Insurance. Accessed 4 December 2018: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsProjected.html>.
- ¹¹ Massachusetts Center for Health Information and Analysis. Annual Report on the Massachusetts Health Care System, September 2018. Accessed 05 December 2018: <http://www.chiamass.gov/annual-report>.
- ¹² With an assumed start date of January 1, 2020, dollars were estimated at 71.3% of the annual cost, based upon an assumed renewal distribution by month (Jan through Dec) by market segment and the Massachusetts market segment composition.
- ¹³ See H.B. 2978 Efficacy Report.

Appendix A: Membership Affected by the Proposed Language

Membership potentially affected by a proposed mandated change to the use of medical necessity criteria may include Commonwealth residents with fully-insured employer-sponsored health insurance issued by a Commonwealth-licensed company (including through the GIC); non-residents with fully-insured employer-sponsored insurance issued in the Commonwealth; Commonwealth residents with individual (direct) health insurance coverage; and lives covered by GIC self-insured coverage. BerryDunn's 2020 – 2024 membership projections for these populations are derived from the following sources.

The 2016 MA APCD formed the base for the projections. The MA APCD provided fully-insured and self-insured membership by insurance carrier. The MA APCD was also used to estimate the number of non-residents covered by a Commonwealth policy. These are typically cases in which a non-resident works for a Commonwealth employer that offers employer-sponsored coverage. Adjustments were made to the data for membership not in the MA APCD, based on published membership reports available from CHIA and the Massachusetts Department of Insurance (DOI).

CHIA publishes a quarterly enrollment trends report and supporting databook (enrollment-trends-july-2016-databook¹), which provides enrollment data for Commonwealth residents by insurance carrier for most carriers (some small carriers are excluded). CHIA uses supplemental information beyond the data in the MA APCD to develop its enrollment trends report and provided BerryDunn with details regarding the use of supplemental carrier information for its December 2016 reported enrollment. The supplemental data was used to adjust the resident totals from the MA APCD.

The DOI published reports titled Quarterly Report of HMO Membership in Closed Network Health Plans as of September 30, 2016² and Massachusetts Division of Insurance Annual Report Membership in MEDICAL Insured Preferred Provider Plans by County as of September 30, 2016.³ These reports provide fully-insured covered members for licensed Commonwealth insurers where the member's primary residence is in Commonwealth. The DOI reporting includes all insurance carriers and was used to supplement the MA APCD membership for small carriers not in the MA APCD.

The distribution of members by age and gender was estimated using MA APCD population distribution ratios and was checked for reasonableness and validated against U.S. Census Bureau data.⁴ Membership was projected from 2016 through 2024 using Census Bureau population growth rate estimates by age and gender.⁵

Projections for the GIC self-insured lives were developed using the GIC base data for 2014⁶ and 2015,⁷ as well as the same projected growth rates from the Census Bureau that were used for the Commonwealth population. Breakdowns of the GIC self-insured lives by gender and age were based on the Census Bureau distributions.

Appendix A Endnotes

¹ Center for Health Information and Analysis. Estimates of fully insured and self-insured membership by insurance carrier. Accessed 22 September 2016. www.chiamass.gov/enrollment-in-health-insurance/.

² Massachusetts Department of Insurance. HMO Group Membership and HMO Individual Membership
<http://www.mass.gov/ocabr/docs/doi/managed-care/hmo/4q14dist-group.pdf>,
<http://www.mass.gov/ocabr/docs/doi/managed-care/hmo/4q14dist-individual.pdf>.

³ Massachusetts Department of Insurance. Membership 2014. Accessed 22 September 2016
<http://www.mass.gov/ocabr/docs/doi/managed-care/prefprov/2014-prefprov2.pdf>.

⁴ U.S. Census Bureau. Annual Estimates of the Population for the United States, Regions, States, and Puerto Rico: April 1, 2010 to July 1, 2017. Accessed 6 December 2017: <http://www.census.gov/popest/data/state/totals/2017/index.html>.

⁵ U.S. Census Bureau. Annual Estimates of the Population for the United States, Regions, States, and Puerto Rico: April 1, 2010 to July 1, 2015. Accessed 28 April 2016: <http://www.census.gov/popest/data/state/totals/2015/index.html>.

⁶ Group Insurance Commission. GIC Health Plan Membership by Insured Status FY2016. Accessed 6 December 2018:
<http://www.mass.gov/anf/docs/gic/annual-report/fy2016annual-report.pdf>.

⁷ Group Insurance Commission, Group Insurance Commission Fiscal Year 2016 Annual Report. Accessed 6 December 2018:
<http://www.mass.gov/anf/docs/gic/annual-report/gic-annual-reportfy16.pdf>.