

**CENTER FOR HEALTH  
INFORMATION AND ANALYSIS**

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**MANDATED BENEFIT REVIEW OF SENATE BILL 553  
SUBMITTED TO THE 190TH GENERAL COURT:  
AN ACT PROVIDING HEALTH INSURANCE COVERAGE  
FOR SCALP AND FACIAL HAIR PROSTHESIS**

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## TABLE OF CONTENTS

<b>Benefit Mandate Overview: S.B. 553: An Act providing health insurance coverage for scalp and facial hair prosthesis .....</b>	<b>1</b>
History of the Bill.....	1
What Does the Bill Propose? .....	1
Medical Efficacy of S.B. 553.....	2
Current Coverage.....	2
Cost of Implementing the Bill.....	2
Plans Affected by the Proposed Benefit Mandate.....	3
Plans Not Affected by the Proposed Benefit Mandate.....	3
<b>Medical Efficacy Assessment .....</b>	<b>3</b>
<b>Alopecia .....</b>	<b>3</b>
Alopecia Related to Cancer Treatment.....	4
Alopecia Areata (Including Alopecia Totalis).....	4
Alopecia Related to Non-Classical Adrenal Hyperplasia with 21-Hydroxylase Deficiency .....	5
Alopecia Related to Injury.....	7
<b>Hair Prostheses and Medical Pigmentation.....</b>	<b>5</b>
Wigs and Hairpieces.....	6
Medical Pigmentation.....	6
<b>Conclusion.....</b>	<b>7</b>
<b>Endnotes.....</b>	<b>8</b>



## BENEFIT MANDATE OVERVIEW: S.B. 553: AN ACT PROVIDING HEALTH INSURANCE COVERAGE FOR SCALP AND FACIAL HAIR PROSTHESIS

### HISTORY OF THE BILL

The Joint Committee on Financial Services referred Senate Bill (S.B.) 553, “An Act providing health insurance coverage for scalp and facial hair prosthesis,” to the Center for Health Information and Analysis (CHIA) for review.<sup>1</sup> Massachusetts General Laws, Chapter 3, Section 38C, requires CHIA to review and evaluate the potential fiscal impact of each mandated benefit bill referred to the agency by a legislative committee.

### WHAT DOES THE BILL PROPOSE?

S.B. 553, as submitted in the 190<sup>th</sup> General Court, requires coverage of facial medical pigmentation and hair prostheses<sup>i</sup> for the following diagnoses or conditions:

- Cancer or leukemia
- Alopecia areata
- Alopecia totalis
- Non-classical 21-hydroxylase
- Permanent loss of scalp hair due to injury

S.B. 553 does not require coverage for hair prosthesis or facial medical pigmentation for alopecia related to the natural or premature aging process.

Coverage under S.B. 553 shall be provided at a minimum the same amount and frequency as any state insurer provides for hair prostheses as a result of hair loss due to chemotherapy, and subject to:

- A written statement by the treating physician that the facial medical pigmentation or scalp hair prosthesis is medically necessary
- The same limitations and guidelines as other prostheses

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<sup>i</sup> Subsequent to referral of S.B. 553 to CHIA for review, CHIA and its consultants submitted inquiries to the sponsoring legislators about the intent of the bill. The responses indicated that under S.B. 553, mandated coverage for medical pigmentation includes eyebrows and eyelashes only. Mandated coverage for hair prostheses includes wigs and hairpieces. Hair transplant procedures are not included in mandated coverage.

## MEDICAL EFFICACY OF S.B. 553

Alopecia is a dermatological condition in which individuals lose some or all of the hair on their head, and sometimes on their body as well.<sup>2</sup> The extent and duration of hair loss differs depending on its etiology. Therapeutic options are frequently ineffective or unavailable to treat or prevent the recurrence of alopecia.

Individuals who experience alopecia have an increased incidence of psychological disorders, including depression and anxiety. Camouflaging hair loss with wigs, hairpieces, and medical pigmentation to the eyebrows and eyelashes can improve self-image and lessen the negative psychological impact of alopecia.<sup>3</sup> Wigs and hairpieces are fitted onto the scalp and pose no physical risk except discomfort if improperly and loosely fitted. Medical pigmentation carries the same risks as tattoos, and may be contraindicated for some individuals with compromised immune systems. To the extent that this mandate would provide increased coverage of wigs, hairpieces, and medical pigmentation for individuals with alopecia who do not have contraindications to medical pigmentation, the legislation will contribute to improved quality of life for these individuals.

## CURRENT COVERAGE

Current Massachusetts law requires carriers to provide coverage for expenses for scalp hair prostheses worn for hair loss suffered as a result of the treatment of any form of cancer or leukemia; provided, however, that such coverage shall be subject to a written statement by the treating physician that the scalp hair prosthesis is medically necessary; and provided, further, that such coverage shall be limited to the same limitations and guidelines as other prostheses. Under state law, coverage for scalp hair prosthesis shall not exceed \$350 per year.<sup>4</sup>

Current Massachusetts law also requires carriers to provide coverage for prosthetic devices (such as prosthetic limbs) and repairs under the same terms and conditions that apply to other durable medical equipment covered under a policy, and places restrictions on the use of annual or lifetime limits for prosthetic devices.<sup>5</sup>

Massachusetts's benchmark plan<sup>6</sup> requires coverage of one scalp hair prosthesis each calendar year (but no less than \$350 in coverage each calendar year) for members whose hair loss is due to chemotherapy; radiation therapy; infection; burns; traumatic injury; congenital baldness; and medical conditions resulting in alopecia areata (AA) or alopecia totalis (capitus). The benchmark plan does not provide benefits for wigs when hair loss is due to male pattern baldness, female pattern baldness, or natural or premature aging.

## 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 premiums of between \$0.01 PMPM<sup>ii</sup> (0.003%) and \$0.05 PMPM (0.009%). The increase is driven primarily by the requirement for medical pigmentation coverage, as most carriers do not apply the \$350 annual benefit limit and are already providing hair prosthesis (wig and hairpiece) coverage for all the diagnoses in the bill with the exception of Non-Classical Adrenal Hyperplasia with 21-hydroxylase deficiency.

The Massachusetts Division of Insurance and the Commonwealth Health Insurance Connector Authority are responsible for determining any potential state liability associated with the proposed mandate under Section 1311 of the Affordable Care Act (ACA).

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ii PMPM refers to "per member per month."

## PLANS AFFECTED BY THE PROPOSED BENEFIT MANDATE

S.B. 553 applies to commercial 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. It applies to plans grandfathered as exempt from the essential health benefit requirements of the ACA. As drafted, the proposed mandate does not affect Medicaid/MassHealth, although the sponsors indicated that the final version may include Medicaid/MassHealth. CHIA's analysis does not estimate the potential effect of the mandate on Medicaid expenditures.

## PLANS NOT AFFECTED BY THE PROPOSED BENEFIT MANDATE

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

## MEDICAL EFFICACY ASSESSMENT

### ALOPECIA

Alopecia is a dermatological condition in which individuals lose some or all of the hair on their head and sometimes on their body as well.<sup>7</sup> Normally, individuals lose about 50 to 100 scalp hairs a day.<sup>8</sup> When individuals lose significantly more than 100 hairs in a day, the individual is experiencing clinical hair loss.<sup>9</sup>

There are many causes of alopecia. The most common cause of alopecia is androgenetic alopecia (male-pattern or female-pattern hair loss).<sup>10</sup> Androgenetic alopecia is an androgen<sup>iv</sup>-dependent hereditary disorder in which dihydrotestosterone plays a major role.<sup>11</sup> Androgenetic alopecia affects as many as 80% of white men by the age of 70 (male-pattern hair loss) and about half of all women (female-pattern hair loss).<sup>12</sup>

Other common causes of hair loss include drugs (including chemotherapeutic agents); infection, systemic disorders (e.g., disorders that cause high fever, systemic lupus erythematosus, endocrine disorders, and nutritional deficiencies); alopecia areata; and trauma<sup>v</sup> (e.g., trichotillomania, traction alopecia, central centrifugal cicatricial alopecia, burns, radiation, and pressure-induced hair loss).<sup>13</sup> Less commonly, alopecia is the result of primary hair shaft abnormalities, autoimmune diseases, heavy metal poisoning, and rare dermatologic conditions, such as dissecting cellulitis of the scalp.<sup>14</sup>

iii Although GIC plans are not included in the text of the bill as currently drafted, the sponsors indicate that GIC plans will be included in the final version.

iv Androgen refers to a male sex hormone.

v Types of traumatic hair loss are discussed on page 6 of this report.

S.B. 553 requires coverage of hair prostheses and medical pigmentation for cancer treatment, alopecia areata, alopecia totalis, non-classical 21-hydroxylase deficiency, or permanent loss of facial or scalp hair due to injury. S.B. 553 does not require coverage of hair prostheses or medical pigmentation for alopecia that is part of the natural or premature aging process.

Medical research into the psychological problems related to alopecia is frequently secondary to a different focus of the research (e.g., effects of cancer treatment), and therefore, the research is infrequently thorough or systematic.<sup>15</sup> However, medical literature supports that alopecia is psychologically damaging; causes intense emotional suffering; and leads to personal, social, and work-related problems.<sup>16</sup> Studies report an increased incidence of anxiety and depression in patients with alopecia, regardless of the etiology.<sup>17,18</sup> Furthermore, it can adversely affect a person's self-esteem, identity, and quality of life.<sup>19,20</sup>

## Alopecia Related to Cancer Treatment

### Chemotherapy

Alopecia is a common side effect of many types of chemotherapy. Chemotherapy works by attacking rapidly dividing cancer cells.<sup>21</sup> Because hair follicles also grow rapidly, they are vulnerable to the effects of chemotherapy.<sup>22</sup> Chemotherapy may cause hair loss all over a cancer patient's body.<sup>23</sup> The degree of hair loss is dependent on the type and dosage used. Hair loss from chemotherapy is temporary and grows back after therapy has been completed.<sup>24</sup>

Both men and women report hair loss as one of the most feared side effects of cancer treatment,<sup>25</sup> although the medical literature focuses primarily on its effect on women. Alopecia is reported as the most disturbing anticipated side effect by 58% of women planning for chemotherapy.<sup>26</sup> An estimated 8% of women are at risk for abstaining from chemotherapy because of hair loss.<sup>27</sup> Women with cancer who experience alopecia as a side effect to cancer treatment, compared to women with cancer and no alopecia, report lower self-esteem, poorer body image, and lower quality of life.<sup>28</sup> After physician recommendations, body image and effects on sexuality are the most influential factors considered by women when choosing cancer treatment.<sup>29</sup>

### Radiation

Radiation targets rapidly growing cells and affects hair in the area being irradiated.<sup>30</sup> Radiation therapy will generally cause hair loss to the area of the body being treated.<sup>31</sup> Hair loss from radiation may or may not be permanent.<sup>32</sup> Hair loss may range from thinning to complete baldness, and is dependent on dose.<sup>33</sup> Radiation therapy may retard hair growth.<sup>34</sup> Regrowth does not usually begin until several months after radiation treatment is completed. The majority of medical literature reports on alopecia as it relates to chemotherapy or cancer treatment more generally rather than radiation specifically.

## Alopecia Areata (Including Alopecia Totalis)

Alopecia areata is an autoimmune disorder characterized by patches of non-scarring alopecia<sup>vi</sup> affecting scalp and body hair.<sup>35</sup> AA may be limited to one or more discrete, well-circumscribed round or oval patches of hair loss on the scalp or body, or it may affect the entire scalp (alopecia totalis) or the entire body (alopecia universalis).<sup>36</sup> The course of the disease is unpredictable, with spontaneous regrowth of hair occurring in 80% of those affected within the first year, and relapse can occur at any given time.<sup>37</sup> Patients may have periods of regrowth, stability, and loss.<sup>38</sup> Genetic predisposition has been demonstrated, although environmental insults (e.g., viral infections, trauma, or psychological stress) are also suspected to contribute to the disease.<sup>39</sup>

vi Non-scarring alopecia is loss of hair without scarring and is potentially reversible.

There is no cure for AA, and treatment options have only limited success with hair regrowth. No treatment options are available to prevent disease relapse, and there are no biomarkers to predict a flare-up.<sup>40</sup> Prescribed treatments for AA include topical, locally injected, or systemic steroids; topical immunotherapy; topical minoxidil; topical irritants, such as anthralin; and systemic immunosuppressants, such as cyclosporine or methotrexate.

In a population study of AA, based in Olmsted County, Minnesota, the lifetime incidence of AA was estimated at 2.1%,<sup>41</sup> up from 1.7% in a population study 20 years prior.<sup>42</sup> The estimated prevalence of AA is 0.15% in the U.S. population.<sup>43</sup>

AA alters one's appearance and can lead to significant emotional distress.<sup>44</sup> AA often has devastating effects on quality of life and self-esteem.<sup>45,46</sup> Studies have shown an increased incidence in psychiatric diagnoses, particularly depression and anxiety, among individuals with alopecia areata.<sup>47,48</sup> Other psychiatric diagnoses with an increased incidence include social phobia and paranoid disorder.<sup>49</sup> Pediatric patients frequently report bullying by peers.<sup>50</sup>

### **Alopecia Related to Non-Classical Adrenal Hyperplasia with 21-Hydroxylase Deficiency**

Congenital adrenal hyperplasia (CAH) is a group of inherited genetic disorders that affect the adrenal glands, a pair of walnut-sized organs above the kidneys.<sup>51</sup> The adrenal glands are responsible for producing a variety of hormones that regulate many essential functions in the body.<sup>52</sup> "Non-classical" CAH is the milder and more common form of the disorder.<sup>53</sup>

In 95% of cases, 21-hydroxylase is the enzyme lacking in CAH, and often CAH is called 21-hydroxylase deficiency. CAH is autosomal recessive,<sup>vii</sup> and the adrenal glands produce excess androgens (i.e., male hormones) in children who have the condition.<sup>54</sup> Non-classic CAH may not become evident until childhood to early adulthood. Symptoms may include early, irregular, or absent menstrual periods; premature development of body hair (pubic and underarm); body odor as a young child; early growth spurt but ultimately short stature as adult; mood swings; oily hair and skin; severe acne; infertility; and masculine characteristics, such as facial hair in women. Women may develop male pattern baldness as they grow older.<sup>55,56</sup>

Non-classical CAH related to 21-hydroxylase deficiency is the most frequent of all autosomal recessive genetic diseases, and its prevalence is estimated to be 1 in 1,000 individuals in the United States.<sup>57</sup> It is more common in certain ethnic groups, such as Ashkenazi Jews, in whom 1 in 27 express the disease.<sup>58</sup>

### **Alopecia Related to Injury**

Traumatic alopecia is hair loss related to an injury to the scalp. It can be the result of physical or chemical injury to the hair and scalp.

Hair can be lost related to any of the following:

- Physical trauma (e.g., a car crash)
- Serious burn
- Strain or tension from hair-styling, such as ponytails (i.e., traction alopecia)
- Prolonged pressure (e.g., immobilization during general anesthesia)
- Hair-pulling disorder (i.e., trichotillomania), which is a mental disorder that involves recurrent, irresistible urges to pull out hair from scalp, eyebrows, or other areas of the body<sup>59</sup>

Hair will grow back in individuals with traction alopecia if the strain or tension is removed. However, in other types of traumatic alopecia, hair regrowth is dependent on whether the hair loss was scarring or non-scarring. Once there is too much scar tissue, hair can no longer grow back.

vii Autosomal recessive means that two copies of an abnormal gene must be present in order for the disease to develop.

Central Centrifugal Cicatricial Alopecia (CCCA) is a scarring type of traumatic alopecia that is seen more commonly in women of African descent, with a prevalence ranging from 2.7% to 5.7%.<sup>60</sup> CCCA is a common cause of progressive permanent apical alopecia.<sup>61</sup> It usually starts at the vertex or mid top of the scalp and gradually spreads centrifugally (i.e., in a pattern that moves out from a center).<sup>62</sup> Certain hair care practices, such as hair weaving and chemical use, have been associated with an increased risk for developing CCCA, although there is developing evidence to suggest that its etiology is multifactorial.<sup>63</sup>

## HAIR PROSTHESES AND MEDICAL PIGMENTATION

Hair prostheses and medical pigmentation are considered camouflaging agents to decrease the psychological burden of alopecia.<sup>64</sup> The literature supports having providers educate their patients about these options.<sup>65</sup> Cancer centers, such as Dana-Farber Cancer Institute, provide information about wigs on their websites.<sup>66</sup> There is minimal information about medical pigmentation posted by providers on the internet. More commonly, information about medical pigmentation is provided by salons.

### Wigs and Hairpieces

Hair prostheses, as referenced in S.B. 553, include wigs and hairpieces. Wigs and hairpieces can be made from synthetic hair, human hair, or a combination of the two. Medical literature does not support any risks sustained by wearing wigs, but there can be some discomfort from wigs that are improperly or loosely fitted.<sup>67</sup>

### Medical Pigmentation

Medical pigmentation is also called micropigmentation or permanent makeup. It consists of implantation of pigment into the skin, similar to a tattoo. It can be used to camouflage missing eyebrows or eyelashes in individuals with alopecia. There is scarce medical literature dedicated to this field, although the procedure is becoming more popular.<sup>68</sup> Medical pigmentation carries the same risks as other tattoo procedures. Possible adverse effects include fanning, fading, and scarring;<sup>69</sup> granulomatous inflammatory reactions; allergic contact dermatitis; phototoxicity; hypomelanosis; and infections.<sup>70,71</sup> Differing provider skill levels can lead to differing results (e.g., unnatural or unevenly shaped eyebrows), and care must be taken to maintain sterile technique and to clean, sterilize, and dispose of equipment and supplies properly.

In Massachusetts, the Department of Public Health put forth standards as “model” regulations<sup>72</sup> for adoption by local Boards of Health with the anticipation of a state statutory framework and regulations.<sup>73</sup> The model regulations set forth suggested standards of practice for the operation of body art establishments. There are currently bills (H.B. 132<sup>74</sup> and S.B. 99<sup>75</sup>) referred to the committee on Consumer Protection and Professional Licensure to require professional licensure and increased state regulation of body art, including medical pigmentation.

## CONCLUSION

Camouflaging hair loss with wigs, hairpieces, and medical pigmentation to the eyebrows and eyelashes can improve self-image and lessen the negative psychological impact of alopecia.<sup>76</sup> Medical pigmentation must be performed in an environment conducive to sterile technique to prevent infection.<sup>77</sup> Medical pigmentation may not be appropriate for patients who may be at greater risk for infection, such as those receiving chemotherapy. To the extent that this mandate would provide increased coverage of wigs, hairpieces, and medical pigmentation for individuals with alopecia, and for whom medical pigmentation is not contraindicated, the legislation will contribute to improved quality of life for those individuals experiencing alopecia.

## ENDNOTES

- 1 The 190th General Court of the Commonwealth of Massachusetts, Senate Bill 553, "An Act providing health insurance coverage for scalp and facial hair prosthesis." Accessed 21 December 2017: <https://malegislature.gov/Bills/190/S553>.
- 2 Hunt N and McHale S. The psychological impact of alopecia. *BMJ* 2005;331:951. Accessed 11 January 2018: <http://www.bmj.com/content/331/7522/951>.
- 3 Saed S, Ibrahim O, Bergfeld W. Hair camouflage: A comprehensive review. *Int J Womens Dermatol*. 2016 Dec; 2(4): 122–127. Accessed 17 January 2018: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5418894/>.
- 4 M.G.L. 32A §17E, 175 §47T, 176A §8T, 176B §4R, 176G §4J
- 5 M.G.L. c.175 §47Z; c.176A §8AA; c.176B §4AA; c.176G §4S; c.32A §17I
- 6 Essential Health Benefit Benchmark Plan – 2017. Accessed 19 January 2018. Accessed 19 January 2018: <http://www.mass.gov/ocabr/insurance/providers-and-producers/doi-regulatory-info/essential-health-benefit-benchmark-plan-2017.html>.
- 7 Op Cit. Hunt N and McHale S.
- 8 American Academy of Dermatology. Do you have hair loss or hair shedding? Accessed 17 January 2018: <https://www.aad.org/public/skin-hair-nails/hair-care/hair-loss-vs-hair-shedding>.
- 9 Op cit. American Academy of Dermatology. Do you have hair loss or hair shedding?
- 10 Op cit. American Academy of Dermatology. Do you have hair loss or hair shedding?
- 11 Op cit. American Academy of Dermatology. Do you have hair loss or hair shedding?
- 12 Op cit. American Academy of Dermatology. Do you have hair loss or hair shedding?
- 13 Op cit. American Academy of Dermatology. Do you have hair loss or hair shedding?
- 14 Op cit. American Academy of Dermatology. Do you have hair loss or hair shedding?
- 15 Op Cit. Hunt N and McHale S.
- 16 Op Cit. Hunt N and McHale S.
- 17 Op Cit. Hunt N and McHale S.
- 18 Davis D and Callender V. Review of quality of life studies in women with alopecia. *International Journal of Women's Dermatology*. Accessed 17 January 2018: <https://www.sciencedirect.com/science/article/pii/S2352647517300989>.
- 19 Op Cit. Hunt N and McHale S.
- 20 Op Cit. Davis D and Callender V.
- 21 Dana-Farber Cancer Institute. For Patients & Families. Wigs and Hair Prostheses for Cancer. Accessed 17 January 2018: <http://www.dana-farber.org/for-patients-and-families/care-and-treatment/support-services-and-amenities/friends-place/services-and-programs/wigs-and-hair-prostheses/#faq10>.
- 22 Op Cit. Dana-Farber Cancer Institute. For Patients & Families. Wigs and Hair Prostheses for Cancer.
- 23 Op Cit. Dana-Farber Cancer Institute. For Patients & Families. Wigs and Hair Prostheses for Cancer.
- 24 Op Cit. Dana-Farber Cancer Institute. For Patients & Families. Wigs and Hair Prostheses for Cancer.
- 25 Mayo Clinic. Chemotherapy and hair loss: What to expect during treatment. Accessed 21 January 2018; <https://www.mayoclinic.org/tests-procedures/chemotherapy/in-depth/hair-loss/art-20046920>.
- 26 McGarvey, EL, Baum, LD, Pinkerton, RC, and Rogers, LM. (2001), Psychological Sequelae and Alopecia Among Women with Cancer. *Cancer Practice*, 9: 283–289. Accessed 17 January 2018: <http://onlinelibrary.wiley.com/doi/10.1111/j.1523-5394.2001.96007.pp.x/full>.
- 27 Op Cit. McGarvey, EL, Baum LD, Pinkerton RC, and Rogers, LM.
- 28 Op Cit. McGarvey, EL, Baum LD, Pinkerton RC, and Rogers, LM.
- 29 Op Cit. McGarvey, EL, Baum LD, Pinkerton RC, and Rogers, LM.
- 30 Op Cit. Dana-Farber Cancer Institute. For Patients & Families. Wigs and Hair Prostheses for Cancer.
- 31 OncoLink. Hair Loss (Alopecia) from Radiation Treatment. Last modified 15 July 2016. Accessed 17 January 2018: <https://www.oncolink.org/support/side-effects/hair-loss-thinning/hair-loss-alopecia-from-radiation-treatment>.
- 32 Op Cit. OncoLink. Hair Loss (Alopecia) from Radiation Treatment.
- 33 Op Cit. OncoLink. Hair Loss (Alopecia) from Radiation Treatment.
- 34 Op Cit. OncoLink. Hair Loss (Alopecia) from Radiation Treatment.
- 35 Fricke A and Miteva M. Epidemiology and burden of alopecia areata: a systematic review. *Clin Cosmet Investig Dermatol*. 2015; 8: 397–403. Accessed 18 January 2018: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4521674/>.
- 36 Op Cit. Fricke A and Miteva M.
- 37 Op Cit. Fricke A and Miteva M.

- 38 Hordinsky M. Alopecia Areata: The Clinical Situation. *Journal of Investigative Dermatology Symposium Proceedings*. 2018; 19: S9-11. Accessed 17 January 2018: [http://www.jidsponline.org/article/S1087-0024\(17\)30048-5/fulltext](http://www.jidsponline.org/article/S1087-0024(17)30048-5/fulltext).
- 39 Op Cit. Fricke A and Miteva M.
- 40 Op Cit. Hordinsky M.
- 41 Mirzoyev S, Schrum A, Davis M, Torgerson R. Lifetime incidence risk of Alopecia Areata estimated at 2.1 percent by Rochester Epidemiology Project, 1990-2009. *J Invest Dermatol*. 2014 Apr; 134(4): 1141–1142. Accessed 18 January 2018: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3961558/>.
- 42 Safavi KH, Muller SA, Suman VJ, Moshell AN, Melton LJ., 3rd Incidence of alopecia areata in Olmsted County, Minnesota, 1975 through 1989. *Mayo Clin Proc*. 1995;70(7):628–633. Accessed 17 January 2018: <https://www.ncbi.nlm.nih.gov/pubmed/7791384>.
- 43 Harris, M, Sun J, King, L. Clinical Review: Management of alopecia areata. Accessed 18 January 2018: [http://www.bmj.com/bmj/section-pdf/186632?path=/bmj/34/1/7766/Clinical\\_Review.full.pdf](http://www.bmj.com/bmj/section-pdf/186632?path=/bmj/34/1/7766/Clinical_Review.full.pdf).
- 44 Rodgers A. Why Finding a Treatment for Alopecia Areata Is Important: A Multifaceted Perspective. [http://www.jidsponline.org/article/S1087-0024\(17\)30041-2/fulltext](http://www.jidsponline.org/article/S1087-0024(17)30041-2/fulltext).
- 45 Gilhar A, Etzioni A, and Paus R. Alopecia Areata. *N Engl J Med* 2012; 366:1515-1525. Accessed 17 January 2018: <http://www.nejm.org/doi/full/10.1056/nejmra1103442>.
- 46 Strazzula LC, Wang EHC, Avila L, Lo Sicco K, Brinster N, Christiano AM, Shapiro J. Alopecia areata: Disease characteristics, clinical evaluation, and new perspectives on pathogenesis. Accessed 17 January 2018: <https://www.ncbi.nlm.nih.gov/pubmed/29241771>.
- 47 Colon E, Popkin M, Callie A, Dessert N, Hordinsky M. Lifetime Prevalence of psychiatric disorders in patients with alopecia areata. *Comprehensive Psychiatry* 1991; 32: 245-251. Accessed 17 January 2018: <http://www.sciencedirect.com/science/article/pii/0010440X9190045E>.
- 48 Koo J, Shello W, Hallman C, Edwards J. Alopecia areata and increased prevalence of psychiatric disorders. *International Journal of Dermatology*, 33: 849–850. Accessed 17 January 2018: <http://onlinelibrary.wiley.com/doi/10.1111/j.1365-4362.1994.tb01018.x/full>.
- 49 Op Cit. Koo J, Shello W, Hallman C, Edwards J.
- 50 Christensen T, Yang J, Castelo-Soccio L. Bullying and Quality of Life in Pediatric Alopecia Areata. *Skin Appendage Disord*. 2017 Aug;3(3):115-118. Accessed 17 January 2018: <https://www.ncbi.nlm.nih.gov/pubmed/28879186>.
- 51 Mayo Clinic. Congenital adrenal hyperplasia. Accessed 17 January 2018: <https://www.mayoclinic.org/diseases-conditions/congenital-adrenal-hyperplasia/symptoms-causes/syc-20355205>.
- 52 Op Cit. Mayo Clinic. Congenital adrenal hyperplasia.
- 53 Op Cit. Mayo Clinic. Congenital adrenal hyperplasia.
- 54 Op Cit. Mayo Clinic. Congenital adrenal hyperplasia.
- 55 Op Cit. Mayo Clinic. Congenital adrenal hyperplasia.
- 56 CARESFoundation. What is Congenital Adrenal hyperplasia (CAH)? Accessed 19 January 2018: <http://www.caresfoundation.org/what-is-cah/non-classical-cah/>.
- 57 NIH U.S. National Library of Medicine. Genetics Home Reference. Your Guide to Understanding Genetic Conditions. Accessed 17 January 2018: <https://ghr.nlm.nih.gov/condition/21-hydroxylase-deficiency#inheritance>.
- 58 Op Cit. NIH U.S. National Library of Medicine. Genetics Home Reference. Your Guide to Understanding Genetic Conditions.
- 59 Mayo Clinic: Trichotillomania (hair-pulling disorder). Accessed 19 January 2018: <https://www.mayoclinic.org/diseases-conditions/trichotillomania/symptoms-causes/syc-20355188>.
- 60 Dlova N, Salkey K, Callinder V, McMichael A. Central Centrifugal Cicatricial Alopecia: New Insights and a Call for Action. *Journal of Investigative Dermatology Symposium Proceedings*, Volume 18, Issue 2, S54 – S56. Accessed 19 January 2018: [http://www.jidsponline.org/article/S1087-0024\(17\)30004-7/abstract](http://www.jidsponline.org/article/S1087-0024(17)30004-7/abstract).
- 61 Blattner C, Polley D, Ferritto F, and Elston D. Central centrifugal cicatricial alopecia. *Indian Dermatol Online J*. 2013 Jan-Mar; 4(1): 50–51. Accessed 17 January 2018: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3573455/>.
- 62 Whiting, D. A. and Olsen, E. A. (2008), Central centrifugal cicatricial alopecia. *Dermatologic Therapy*, 21: 268–278. Accessed 17 January 2018: <http://onlinelibrary.wiley.com/doi/10.1111/j.1529-8019.2008.00209.x/full>.
- 63 Op Cit. Blattner C, Polley D, Ferritto F, and Elston D.
- 64 Op Cit. Rodgers R.
- 65 Op Cit. Hunt N.
- 66 Op Cit. Dana-Farber Cancer Institute. For Patients & Families. Wigs and Hair Protheses for Cancer.
- 67 Op Cit. Dana-Farber Cancer Institute. For Patients & Families. Wigs and Hair Protheses for Cancer.
- 68 Goldman, A and Wollina U. Severe unexpected adverse effects after permanent eye makeup and their management by Q-switched Nd:YAG laser. Accessed 19 January 2018 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4136952/>.
- 69 De Cuyper C. Permanent Makeup: Indications and complications. *Clin Dermatol*. 2008 Jan-Feb;26(1):30-4. Accessed 19 January 2018: <https://www.ncbi.nlm.nih.gov/pubmed/18280902>.
- 70 Op Cit. Goldman A and Wollina U.

- 
- 71 Mihelarakis A, KKousoula P, Varvaresou A, and Iakovou K. A study Regarding the Dermocosmetic Care of Cutaneous Adverse Effects Associated With Chemotherapy among Breast Cancer Patients. *Int J Cancer Res Ther*, 2017. Accessed 19 January 2018: <http://www.opastonline.com/wp-content/uploads/2017/07/a-study-regarding-the-dermocosmetic-care-of-cutaneous-adverse-effects-associated-with-chemotherapy-among-breast-cancer-patients-ijcrt-17-013.pdf>.
  - 72 Model Regulations for Body Art Establishments. Accessed 19 January 2018: <http://www.mass.gov/eohhs/docs/dph/environmental/sanitation/bodyart-model-regs.pdf>.
  - 73 The Commonwealth of Massachusetts Executive Office of Health and Human Services Department of Public Health Memorandum to Howard K. Koh, MD, Commissioner, and Members of the Public Health Council from Nancy Ridley, MS, Assistant Commissioner, Bureau of Health Quality Management. Dated 23 January 2001. Accessed 19 January 2018: <http://www.mass.gov/eohhs/docs/dph/environmental/sanitation/bodyart-memo20010123-info-briefing-reg.pdf>.
  - 74 H.B. 132. Accessed 19 January 2018: <https://malegislature.gov/Bills/190/H132>.
  - 75 S.B. 99. Accessed 19 January 2018: <https://malegislature.gov/Bills/190/S99>.
  - 76 Saed S, Ibrahim O, Bergfeld W. Hair camouflage: A comprehensive review. *Int J Womens Dermatol*. 2016 Dec; 2(4): 122–127. Accessed 17 January 2018: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5418894/>.
  - 77 Garg, G. and Thami, G. P. (2005), Micropigmentation: Tattooing for Medical Purposes. *Dermatologic Surgery*, 31: 928–931. Accessed 19 January 2018: <http://onlinelibrary.wiley.com/doi/10.1111/j.1524-4725.2005.31807.full>.



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**Actuarial Assessment of  
Senate Bill 553  
Submitted to the 190<sup>th</sup> General Court:  
“An act providing health insurance coverage for scalp and  
facial hair prosthesis”**

**Prepared for:**  
Commonwealth of Massachusetts  
Center for Health Information and  
Analysis

**Prepared by:**  
BerryDunn

March 2018



## Table of Contents

Table of Contents .....	i
1.0 Executive Summary .....	1
1.1 Scalp and Facial Hair Prostheses and Medical Pigmentation .....	1
1.2 Existing Laws Regarding Hair Prostheses .....	1
1.3 Analysis .....	2
1.4 Summary Results .....	3
1.5 Executive Summary Endnotes .....	4
2.0 Introduction .....	6
3.0 Interpretation of S.B. 553 .....	6
3.1 Plans Affected by the Proposed Mandate .....	7
3.2 Covered Conditions and Services .....	7
3.3 Existing Laws Affecting the Cost of S.B. 553 .....	8
4.0 Methodology .....	9
4.1 Overview .....	9
4.2 Data Sources .....	9
4.3 Steps in the Analysis .....	10
4.4 Limitations .....	13
5.0 Analysis .....	13
5.1 Changes in Annual Limits .....	14
5.2 Coverage for NCAH With 21-Hydroxylase Deficiency .....	16
5.3 Facial Pigmentation .....	18
5.4 Marginal Medical Expense Per Member Per Month .....	20
5.5 Projected Fully-insured Population in Massachusetts .....	20
5.6 Total Marginal Medical Expense .....	21
5.7 Carrier Retention and Increase in Premium .....	21
6.0 Results .....	22
6.1 Five-Year Estimated Impact .....	22
6.2 Impact on the GIC .....	23
Appendix A: Membership Affected by the Proposed Mandate .....	25
Endnotes .....	26

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## 1.0 Executive Summary

Massachusetts Senate Bill (S.B.) 553,<sup>1</sup> as submitted in the 190<sup>th</sup> General Court, would expand health insurance coverage of hair prostheses (such as wigs) to additional diagnoses and require coverage of medical pigmentation (such as micropigmentation of the eyebrow or eyelash area, also called “permanent makeup”) in the Commonwealth. S.B. 553 also requires that scalp and facial hair prostheses (including medical pigmentation) be covered on a non-discriminatory basis vis-à-vis any other prosthetic device.

Massachusetts General Law (M.G.L.) c.3 §38C charges the Massachusetts Center for Health Information and Analysis (CHIA) with reviewing the potential impact of proposed mandated healthcare insurance benefits on the premiums paid by businesses and consumers. CHIA has engaged BerryDunn to provide an actuarial estimate of the effect that enactment of S.B. 553 would have on the cost of health insurance in Massachusetts.

### 1.1 Scalp and Facial Hair Prostheses and Medical Pigmentation

Alopecia is a dermatological condition in which individuals lose some or all of their scalp hair; body hair may also be affected.<sup>2</sup> The extent and duration of hair loss differs depending on its cause. Therapeutic options are frequently ineffective or unavailable to treat or prevent the recurrence of alopecia.

Individuals who experience alopecia have an increased incidence of psychological disorders, including depression and anxiety. Camouflaging hair loss with wigs, hairpieces, and medical pigmentation to the eyebrows and eyelashes can improve self-image and lessen the negative psychological impact of alopecia.<sup>3</sup> Wigs and hairpieces are fitted onto the scalp and pose no physical risk except discomfort. Medical pigmentation carries the same risks as tattoos, and may be contraindicated for some individuals with a compromised immune system.

To the extent this mandate would provide increased coverage of wigs, hairpieces, and medical pigmentation<sup>1</sup> for individuals with alopecia caused by diagnoses included in the bill, the legislation will contribute to improved quality of life for these individuals.

### 1.2 Existing Laws Regarding Hair Prostheses

Current Massachusetts law requires healthcare insurance carriers to provide coverage for expenses for scalp hair prostheses worn for hair loss suffered as a result of treatment for any form of cancer or leukemia, subject to the same limitations and guidelines as other prostheses. This mandated coverage is limited to \$350 per year.<sup>4</sup>

Current Massachusetts law also requires carriers to provide coverage for prosthetic devices (such as prosthetic limbs) and repairs under the same terms and conditions that apply to other durable medical equipment covered under a policy, and places restrictions on the use of annual

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<sup>1</sup> For individuals without contraindications to medical pigmentation.

or lifetime limits for prosthetic devices.<sup>5</sup> The only carrier currently applying limits to hair prostheses (for large group business) does not have annual limits on DME/prosthetic coverage, so S.B. 553's requirement that hair prostheses not be covered in a more limited fashion than other prostheses implies this limit would need to be discontinued.

Massachusetts's Patient Protection and Affordable Care Act (ACA) benchmark plan, which sets minimum coverage standards for individual and small group policies sold on the Massachusetts Health Connector<sup>6</sup> (Massachusetts's ACA insurance marketplace or exchange), requires coverage of one scalp hair prosthesis each calendar year with no cost limit<sup>ii</sup> for members whose hair loss is due to: chemotherapy; radiation therapy; infection; burns; traumatic injury; congenital baldness; and medical conditions resulting in alopecia areata or alopecia totalis (capitus). The benchmark plan does not provide benefits for wigs when hair loss is due to male pattern baldness, female pattern baldness, or natural or premature aging. The diagnostic categories required by the benchmark plan overlap with the requirements of S.B. 553; however, the benchmark plan does not provide coverage for facial medical pigmentation, making that requirement an incremental coverage requirement.

### 1.3 Analysis

BerryDunn estimated the impact of S.B. 553 by separately estimating the potential cost of three components for the fully-insured Massachusetts population under age 65:

- Changing annual dollar limits for coverage
- Expanding coverage to an additional diagnosis
- Covering facial pigmentation

BerryDunn then aggregated these components, projected them forward over the next five years (2019 – 2023) and added insurer retention (administrative cost and profit) to arrive at an estimate of the bill's effect on premiums. Note that the estimates assume carriers will fully comply with the provisions of the bill if it becomes law.

This analysis relies on estimates of the rates at which fully-insured female members with alopecia related to non-classical adrenal hyperplasia (NCAH) with 21-hydroxylase deficiency will seek coverage for wigs, and fully-insured members with all covered diagnoses will seek facial pigmentation.

Prevalence of NCAH in the U.S. population is estimated at approximately 1 in 1,000 individuals.<sup>7</sup> 95% of patients with NCAH have 21-hydroxylase deficiency.<sup>8</sup> Male pattern baldness is a known symptom of the disease in women, but there are no comprehensive statistics on the proportion of women with NCAH who will experience significant alopecia that is not responsive to treatment (such as hormone therapy) or for whom treatment is contra-indicated. This analysis relies on an estimate that 19% of women aged 40 – 49 with NCAH

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<sup>ii</sup> The BCBS-MA benchmark cites the state law minimum coverage of \$350 but does not state a maximum benefit.

experience male pattern baldness,<sup>9</sup> and, models a wide range, including a very conservative high-cost scenario assumption of judgment-based parameters regarding the proportion of women with NCAH-related male pattern baldness who would seek healthcare insurance reimbursement for a wig.

Responses to a carrier survey conducted by BerryDunn regarding the bill indicated that one carrier currently covers facial medical pigmentation, but there is no claim history for these services in the Massachusetts All Payer Claims Database (MA APCD). BerryDunn assumed that no individuals with (temporary) alopecia due to cancer treatment would seek facial pigmentation, while all individuals with alopecia totalis and alopecia universalis—potentially longer term, recurring, or even permanent conditions—would seek facial pigmentation.

Uncertainties requiring such assumptions are addressed by modeling a range of assumptions within reasonable judgment-based limits, and producing a range of incremental impact estimates based on varying these parameters.

#### **1.4 Summary Results**

Table ES-1 summarizes the estimated effect of S.B. 553 on premiums for fully-insured plans over five years. This analysis estimates that the mandate, if enacted as drafted for the 190<sup>th</sup> General Court, would increase premiums in the fully-insured market by as much as 0.009% on average over the next five years; a more likely increase is in the range of 0.004%, equivalent to an average annual expenditure of \$514,000 over the period 2019 – 2023.

The impact on premiums is driven by the provisions of the bill requiring coverage of facial medical pigmentation, removing the \$350 annual benefit limit, and adding NCAH to the list of covered diagnoses.

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 mandate.

**Table ES-1: Summary Results**

	2019	2020	2021	2022	2023	Weighted Average	Five-Year Total
Members (000s)	2,154	2,150	2,146	2,142	2,138		
Medical Expense Low (\$000s)	\$202	\$303	\$324	\$347	\$372	\$329	\$1,548
Medical Expense Mid (\$000s)	\$233	\$431	\$462	\$494	\$530	\$456	\$2,150
Medical Expense High (\$000s)	\$538	\$977	\$1,047	\$1,123	\$1,202	\$1,037	\$4,888
Premium Low (\$000s)	\$227	\$341	\$365	\$391	\$419	\$370	\$1,744
Premium Mid (\$000s)	\$263	\$485	\$520	\$557	\$597	\$514	\$2,422
Premium High (\$000s)	\$606	\$1,101	\$1,180	\$1,265	\$1,355	\$1,169	\$5,507
PMPM Low	\$0.01	\$0.01	\$0.01	\$0.02	\$0.02	\$0.01	\$0.01
PMPM Mid	\$0.01	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02
PMPM High	\$0.03	\$0.04	\$0.05	\$0.05	\$0.05	\$0.05	\$0.05
Estimated Monthly Premium	\$493	\$502	\$512	\$523	\$533	\$513	\$513
Premium % Rise Low	0.003%	0.003%	0.003%	0.003%	0.003%	0.003%	0.003%
Premium % Rise Mid	0.003%	0.004%	0.004%	0.004%	0.004%	0.004%	0.004%
Premium % Rise High	0.007%	0.008%	0.009%	0.009%	0.010%	0.009%	0.009%

## 1.5 Executive Summary Endnotes

<sup>1</sup> The 190<sup>th</sup> General Court of the Commonwealth of Massachusetts, Senate Bill 553, An Act providing health insurance coverage for scalp and facial hair prosthesis: <https://malegislature.gov/Bills/190/S553>.

<sup>2</sup> Hunt N and McHale S. The psychological impact of alopecia. *BMJ* 2005;331:951. Accessed 11 January 2018: <http://www.bmj.com/content/331/7522/951>.

<sup>3</sup> Saed S, Ibrahim O, Bergfeld W. Hair camouflage: A comprehensive review. *Int J Womens Dermatol*. 2016 Dec; 2(4): 122–127. Accessed 17 January 2018: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5418894/>.

<sup>4</sup> M.G.L. 32A §17E, 175 §47T, 176A §8T, 176B §4R, 176G §4J

<sup>5</sup> M.G.L. c.175 §47Z; c.176A §8AA; c.176B §4AA; c.176G §4S; c.32A §17I

<sup>6</sup> Massachusetts Health Connector. Accessed 17 January 2018: <https://www.mahealthconnector.org/>.

<sup>7</sup> NIH U.S. National Library of Medicine. Genetics Home Reference. Your Guide to Understanding Genetic Conditions. Accessed 17 January 2018: <https://ghr.nlm.nih.gov/condition/21-hydroxylase-deficiency#inheritance>.

<sup>8</sup> Mayo Clinic. Congenital adrenal hyperplasia. Accessed 17 January 2018: <https://www.mayoclinic.org/diseases-conditions/congenital-adrenal-hyperplasia/symptoms-causes/syc-20355205>.

<sup>9</sup> Trapp CM and Oberfield SE. Recommendations for Treatment of Nonclassic Congenital Adrenal Hyperplasia (NCCAH): an Update. *Steroids*. 2012 Mar 10; 77(4): 342–346. Accessed 22 January 2018: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3638754/#R43>.

## 2.0 Introduction

S.B. 553<sup>1</sup> as submitted in the 190<sup>th</sup> General Court, would broaden coverage for hair prostheses to include a diagnosis of alopecia areata, alopecia totalis, NCAH with 21-hydroxylase deficiency, or permanent loss of facial or scalp hair due to injury, provided that the alopecia is not part of the natural or premature aging process. Carriers responding to a BerryDunn survey regarding S.B. 553 report covering scalp hair prostheses for all the listed conditions except NCAH. S.B. 553 also broadens the definition of hair prosthesis to include facial pigmentation, such as pigmentation for eyebrow and eyelashes. It also requires that such coverage be subject to the same limitations and guidelines as other prostheses.

M.G.L. c.3 §38C charges CHIA with, among other duties, reviewing the potential impact of proposed mandated healthcare insurance benefits on the premiums paid by businesses and consumers. CHIA has engaged BerryDunn to provide an actuarial estimate of the effect enactment of the bill would have on the cost of health insurance in Massachusetts.

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. For this analysis, BerryDunn was provided a copy of the bill. BerryDunn asked follow-up questions of the sponsoring legislators to clarify that the intent of the bill is followed in this analysis.

Section 3 of this analysis outlines the provisions and interpretation of the bill. Section 4 summarizes the methodology used for the estimate. Section 5 discusses important considerations in translating the bill's language into estimates of its incremental impact on healthcare costs and steps through the calculations. Section 6 summarizes the results.

## 3.0 Interpretation of S.B. 553

S.B. 553, as submitted in the 190<sup>th</sup> General Court, requires coverage for facial medical pigmentation<sup>iii</sup> and hair prostheses<sup>iv</sup> for the following diagnoses or conditions:

- Cancer or leukemia
- Alopecia areata
- Alopecia totalis
- Non-classical 21-hydroxylase
- Permanent loss of scalp hair due to injury

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<sup>iii</sup> Feedback from the Sponsors indicates that medical pigmentation is intended to include eyebrows and eyelashes.

<sup>iv</sup> Feedback from the Sponsors indicates that wigs and hairpieces are included as hair prostheses, and hair transplant procedures are not included in the bill.

S.B. 553 does not require coverage for hair prostheses or facial medical pigmentation for alopecia related to the natural or premature aging process.

Coverage under S.B. 553 shall be provided, at a minimum, at the same dollar amount and frequency as any state insurer provides for hair prostheses due to hair loss due to chemotherapy, and be subject to the same benefit limitations and guidelines as other prostheses (such as prosthetic limbs). Coverage shall also require a written statement by the treating physician that the facial medical pigmentation or scalp hair prosthesis is medically necessary.

### **3.1 Plans Affected by the Proposed Mandate**

The bill as drafted amends statutes that regulate healthcare insurance carriers in Massachusetts. The bill includes five 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 – 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 Medicaid/MassHealth.

### **3.2 Covered Conditions and Services**

Hair prostheses and medical pigmentation are techniques to camouflage hair loss in patients with alopecia and lessen the associated psychological burden.

#### **3.2.1 Alopecia (Hair Loss)**

Alopecia is a dermatological condition in which individuals lose some or all of their hair on their head; body hair may also be affected.<sup>2</sup> Normally, individuals lose about 50 to 100 scalp hairs a day.<sup>3</sup> When individuals lose significantly more than 100 hairs in a day, the individual is experiencing clinical hair loss.<sup>4</sup>

There are many causes of alopecia, the most common being androgenetic alopecia (male-pattern or female-pattern hair loss).<sup>5</sup> Other common causes of hair loss include drug side effect

(including chemotherapeutic agents), infection, systemic disorders, alopecia areata, and trauma.<sup>6</sup> Less commonly, alopecia is the result of primary hair shaft abnormalities, autoimmune diseases, heavy metal poisoning, and rare dermatologic conditions, such as dissecting cellulitis of the scalp.<sup>7</sup>

Medical research into the psychological problems related to alopecia is frequently secondary to a different focus of the research (e.g., effects of cancer treatment), and therefore, infrequently thorough or systematic.<sup>8</sup> However, the literature supports that alopecia is psychologically damaging; causes intense emotional suffering; and leads to personal, social, and work-related problems.<sup>9</sup>

Studies report an increased incidence of anxiety and depression in patients with alopecia, regardless of the cause. In a clinical review of 34 studies that focused on the psychological consequences of alopecia, the authors concluded that alopecia can be associated with serious psychological consequences, particularly anxiety and depression.<sup>10</sup> Furthermore, it can adversely affect a person's sense of self and identity.<sup>11</sup>

### **3.2.2 Wigs and Hairpieces**

Hair prostheses and medical pigmentation are considered camouflaging agents to decrease the psychological burden of alopecia.<sup>12</sup> Hair prostheses, under S.B. 553, include wigs and hairpieces. Wigs and hairpieces can be made from synthetic hair, human hair, or a combination of the two. Medical literature does not support any risks sustained by wearing wigs, but there can be some discomfort from wigs that are improperly or loosely fitted.<sup>13</sup>

### **3.2.3 Medical Pigmentation**

Medical pigmentation is also called micropigmentation or permanent makeup. It consists of implantation of pigment into the skin, similar to a tattoo. It can be used to camouflage missing eyebrows or eyelashes in individuals with alopecia. There is scarce medical literature dedicated to the procedure, although it is becoming more popular.<sup>14</sup> Medical pigmentation carries the same risks as other tattoo procedures. Possible adverse effects include fanning, fading, and scarring;<sup>15</sup> granulomatous inflammatory reactions; allergic contact dermatitis; phototoxicity; hypomelanosis; and infections.<sup>16</sup> Differing provider skill levels can lead to differing results (e.g., unnatural or unevenly shaped eyebrows), and care must be taken to maintain sterile technique to prevent cross contamination of instruments.

## **3.3 Existing Laws Affecting the Cost of S.B. 553**

Current Massachusetts law requires carriers to provide coverage for expenses for scalp hair prostheses worn for hair loss suffered as a result of the treatment of any form of cancer or leukemia, subject to the same limitations and guidelines as other prostheses. This mandated coverage is limited to \$350 per year.<sup>17</sup>

Current Massachusetts law also requires carriers to provide coverage for prosthetic devices (such as prosthetic limbs) and repairs under the same terms and conditions that apply to other

durable medical equipment covered under a policy, and places restrictions on the use of annual or lifetime limits for prosthetic devices.<sup>18</sup> The only carrier currently applying limits to hair prostheses (for large group business) does not have annual limits on DME/prosthetic coverage, so S.B. 553's requirement that hair prostheses not be covered in a more limited fashion than other prostheses implies this limit would need to be discontinued.

Massachusetts's ACA benchmark plan, which sets minimum coverage standards for individual and small group policies sold on the Massachusetts Health Connector,<sup>19</sup> requires coverage of one scalp hair prosthesis each calendar year with no cost limit<sup>v</sup> for members whose hair loss is due to: chemotherapy; radiation therapy; infection; burns; traumatic injury; congenital baldness; and medical conditions resulting in alopecia areata or alopecia totalis (capitus). The benchmark plan does not provide benefits for wigs when hair loss is due to male pattern baldness, female pattern baldness, or natural or premature aging. The diagnostic categories required by the benchmark plan largely overlap with the requirements of S.B. 553; however, the benchmark plan does not provide coverage for alopecia related to NCAH or facial medical pigmentation, making these provisions incremental coverage requirements.

## 4.0 Methodology

### 4.1 Overview

Estimating S.B. 553's impact on premiums required assessing the incremental impacts described above related to:

- Changing annual dollar limits for coverage
- Expanding coverage to an additional diagnosis
- Covering facial pigmentation

Aggregating the cost of these components, and accounting for carrier retention, resulted in a baseline estimate of the proposed mandate's incremental effect on premiums, which was then projected over the five years following the assumed January 1, 2019, implementation date of the law.

### 4.2 Data Sources

The primary data sources used in the analysis were:

- Information about the intended effect of the bill, gathered from sponsors

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<sup>v</sup> The BCBS-MA benchmark cites the state law minimum coverage of \$350 but does not state a maximum benefit.

- Information, including descriptions of current coverage, from responses to a carrier survey regarding the bill of commercial health insurance carriers in Massachusetts, conducted by BerryDunn<sup>vi</sup>
- Academic literature, published reports, and population data, cited as appropriate
- Massachusetts insurer claim data from CHIA's MA APCD<sup>20</sup> Release 5.0 for service dates in calendar year 2015, for plans covering the over 95% of the under-65 fully-insured population subject to the mandate

### 4.3 Steps in the Analysis

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

#### Estimate costs to insurers of changing the minimum annual coverage limit

In order to estimate the impact of the change in the minimum annual coverage level, BerryDunn:

1. Conducted and reviewed responses to a survey of Massachusetts insurance carriers and concluded that most carriers do *not* apply annual dollar limits to hair prosthesis coverage. One responding carrier applies an annual dollar limit in the large group market.
2. Used claim data from the MA APCD for carriers responding to the survey to calculate the average 2015 hair prosthesis paid unit cost for policies with no annual dollar limit as the middle, best estimate unit cost scenario, and developed corresponding high-cost and low-cost scenario unit cost estimates based on the MA APCD claims analysis.
3. Used claim data from the MA APCD to calculate the average 2015 hair prosthesis paid unit cost for the carrier that applies an annual dollar limit in the large group market and the total number of covered units of hair prostheses subject to the annual dollar limit.
4. Next, calculated the unit cost differential between the carriers applying an annual limit and those carriers that do not apply an annual limit by subtracting the average unit cost under the limit (from Step 3) from the unit cost estimates with no annual dollar limit (from Step 2).
5. Multiplied the resulting cost differential by the number of units subject to the annual dollar limit (calculated in Step 3) to calculate the incremental cost of the increased annual limits.
6. Divided the incremental cost calculated in Step 5 by total 2015 fully-insured member months reported in the MA APCD for members under 65 for the carriers included in the claims analysis to determine the incremental cost paid per member per month (PMPM).

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<sup>vi</sup> Carriers covering over 85% of the under-65 fully -insured population subject to the mandate responded to the survey.

7. Projected this baseline paid PMPM cost forward over the five-year analysis period, 2019 – 2023.

Estimate costs of adding coverage for alopecia related to NCAH

To estimate costs of covering alopecia related to NCAH, BerryDunn:

8. Reviewed publicly available literature to obtain a U.S. prevalence rate for NCAH.
9. Applied the rate from Step 8 to the MA APCD 2015 fully-insured membership reported by carriers responding to the carrier survey to estimate the total number of people in that population with NCAH.
10. Multiplied the total number of members with NCAH from Step 9 by the proportion of members in the carrier-survey population who are female (52%).
11. Reviewed publicly available literature to obtain an estimate of the percent of women aged 40 – 49 with NCAH who will experience hair loss.
12. Multiplied the percentage from Step 11 to the estimated number of women with NCAH from Step 10 to calculate an estimated number of women experiencing NCAH-related hair loss.
13. For the high-cost scenario, assume that 100% of the members in Step 12 will seek treatment. For the low-cost and best estimate scenarios, assume 5% and 50%, respectively.
14. Multiply the best estimate average 2015 MA APCD wig unit cost for carriers not applying an annual benefit limit from Step 2 by the member estimates from Step 13 to calculate the incremental cost of NCAH coverage over the fully-insured membership for carriers responding to the carrier survey.
15. Divide this incremental cost by total MA APCD member months for the carriers responding to the carrier survey to determine the incremental PMPM.
16. Projected this baseline paid PMPM cost forward over the five-year analysis period, 2019 – 2023.

Estimate costs of adding coverage for facial pigmentation

To estimate facial pigmentation coverage costs, BerryDunn:

17. Identified prevalence rates for alopecia totalis and alopecia universalis from publicly available literature.<sup>vii</sup>

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<sup>vii</sup> There is very little publicly available literature on the prevalence of alopecia totalis and alopecia universalis; a European prevalence rate was used for this study: «Prevalence of rare diseases: Bibliographic data », Orphanet Report Series, Rare Diseases collection, June 2017, Number 1: Diseases

18. Multiplied the prevalence rates by the Massachusetts' fully-insured population to determine the total number of people with alopecia totalis and alopecia universalis.
19. Assumed in the low-cost and best-estimate cost scenarios, a conservative assumption that 100% of people with these diagnoses will seek treatment and that over the five-year study period, each person will obtain coverage for one initial treatment and have follow-up treatment in each of the other four years. In the high-cost scenario, the number of individuals seeking treatment was then doubled.
20. Used publicly available literature<sup>21</sup> to determine the typical unit cost of facial pigmentation, including initial and touch-up costs for both eyebrow and eyelash treatments.
21. Using the unit costs estimated in Step 20, calculated a weighted average cost per person over the five-year period for initial and follow-up treatments for eyebrows and eyelashes.
22. Multiplied the weighted average unit cost from Step 21 by the number of cases from Step 19 to determine the incremental medical cost to carriers of the proposed mandated coverage.
23. Divided the incremental cost in Step 22 by total 2015 fully-insured member months reported in the MA APCD for members under 65 for the carriers included in the claims analysis to determine the incremental cost paid PMPM.
24. Projected this baseline paid PMPM cost forward over the five-year analysis period, 2019 – 2023.

Calculate the impact of the combined projected claim costs on insurance premiums

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

25. Summed the estimated incremental paid PMPM costs associated with changes to annual limits and added coverage for facial pigmentation.
26. Estimated the fully-insured Massachusetts population under age 65, projected for the next five years (2019 – 2023).
27. Next, 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 S.B. 553.
28. Finally, estimated insurer retention (administrative costs and profit) and applied the estimate to the final incremental claims cost calculated in Step 27.

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Listed in alphabetical order. Accessed 18 January 2018:  
[http://www.orpha.net/orphacom/cahiers/docs/GB/Prevalence\\_of\\_rare\\_diseases\\_by\\_diseases.pdf](http://www.orpha.net/orphacom/cahiers/docs/GB/Prevalence_of_rare_diseases_by_diseases.pdf).

## 4.4 Limitations

While measuring costs in the MA APCD is relatively straightforward, this analysis also rests on assumptions that hold more uncertainty. For example, this analysis relies on estimates of the rates at which fully-insured female members with alopecia related to NCAH will seek coverage for wigs, and fully-insured members with all covered diagnoses will seek facial pigmentation.

Prevalence of NCAH in the U.S. population is estimated at approximately 1 in 1,000 individuals.<sup>22</sup> Male pattern baldness is a known symptom of the disease in women, but there are no comprehensive statistics on the proportion of women with NCAH who will experience significant alopecia that is not responsive to treatment (such as hormone therapy) or for whom treatment is contra-indicated. This analysis relies on an estimate that 19% of women aged 40 – 49 with NCAH experience male pattern baldness,<sup>23</sup> and, models a wide range, including a very conservative high-cost scenario assumption of judgment-based parameters regarding the proportion of women with NCAH-related male pattern baldness who would seek insurance reimbursement for a wig annually.

This analysis also relies on an estimate of the rate at which fully-insured members with the covered diagnoses will seek facial medical pigmentation. Responses to the carrier survey indicated that one carrier currently covered medical pigmentation, but there is no claim history for these services in the MA APCD. BerryDunn assumed that no individuals with (temporary) alopecia due to cancer treatment would seek facial pigmentation, while all individuals with alopecia totalis and alopecia universalis—potentially longer term, recurring, or even permanent conditions—would seek facial pigmentation. To account for the uncertainty surrounding this assumption, BerryDunn applied this assumption in the low-cost and best estimate scenarios, and assumed in the high-cost scenario that two times the number of individuals with alopecia totalis and alopecia universalis would seek coverage for medical pigmentation.

This range of assumptions within reasonable judgment-based limits produces a range of estimates of incremental cost. The more detailed step-by-step description of the estimation process outlined in the next sections addresses these uncertainties further.

## 5.0 Analysis

S.B. 553 expands the existing state hair prosthesis mandate to require hair prostheses be covered for alopecia diagnoses, including alopecia related to NCAH; to include facial pigmentation in the definition of prosthesis; and to require that hair prosthesis coverage be subject to the same limitations and guidelines as other prostheses.

Section 5.1 describes the steps used to calculate the PMPM expenses associated with the proposed change to annual dollar benefit limits. Section 5.2 estimates the PMPM costs of expanding coverage to include facial pigmentation. Section 5.3 aggregates the marginal PMPM costs for the two provisions of the mandate. Section 5.4 projects the fully-insured population under age 65 in Massachusetts over the 2019 – 2023 analysis period. Section 5.5 calculates the

total estimated marginal cost of S.B. 553, and Section 5.6 adjusts these projections for carrier retention to arrive at an estimate of the bill’s effect on premiums for fully-insured plans.

### 5.1 Changes in Annual Limits

One of the three components contributing to S.B. 553’s effect on premiums is the requirement that coverage of hair prostheses be subject to the same limitation and guidelines as other prostheses. The ACA requires that all plans sold on the state health insurance exchange cover all benefits covered in a state “benchmark” plan. Because the Massachusetts benchmark plan does not apply the \$350 annual limit to hair prosthesis benefits, the \$350 annual limit cannot be applied to any plan sold in the individual or small group markets in Massachusetts. Furthermore, data from a survey of Massachusetts insurance carriers indicates that most carriers do not apply annual dollar limits to hair prosthesis coverage in the large group market.

However, in the large group market, one responding carrier applies the \$350 annual limit allowed under the current Massachusetts hair prosthesis mandate. The proposed mandate would eliminate this annual dollar limit.

To measure the impact of covering hair prostheses with the same limits as other prostheses, BerryDunn analyzed 2015 claim data from Release 5.0 of the MA APCD for the carriers responding to the survey. First, for carriers that do not apply an annual dollar limit, the total paid claim dollars for hair prostheses were divided by the number of paid units in order to determine the unit cost. Second, for the carrier policies that apply a \$350 annual dollar limit, the total paid claim dollars for hair prostheses were divided by the corresponding number of paid units in order to determine the unit cost. The unit cost for the carrier policies that apply an annual dollar limit were then subtracted from the unit cost for policies with no annual dollar limit. The difference represents the middle scenario best estimate marginal cost per unit of the proposed mandate due to changes in annual benefit limits. Table 1 displays these results.

**Table 1: Derivation of Mid-Range Estimated Incremental Unit Cost for Changes in Annual Limits**

	Unit Cost
No Dollar Limit	\$511
\$350 Dollar Limit	\$270
<b>Incremental Cost</b>	<b>\$241</b>

To account for the various sources of uncertainty in this estimate, BerryDunn also modeled high- and low-end cost scenarios. To develop a high-end cost scenario for the removal of annual limits, MA APCD claim data was used to calculate that carrier paid medical expense is approximately 79% of total allowed costs for hair prostheses after accounting for member cost sharing such as copayments, deductibles, and coinsurance. This factor was then applied to the 90<sup>th</sup> percentile allowed unit cost for hair prostheses found in the data, \$1,600, to establish a high-end unit cost scenario of \$1,264 (\$1,600 X 79%). The allowed unit cost was adjusted by the average member cost sharing rate, rather than simply using the 90<sup>th</sup> percentile paid unit

cost, to control for variation in member cost sharing across carriers, plans, and members. In practice, this result correlates closely to the 90<sup>th</sup> percentile paid amount of \$1,280. Subtracting the observed paid unit cost for the carrier policies applying the annual limit, \$270, from this figure yields a high-end incremental unit cost estimate for the removal of annual cost limits of \$994.

For the low scenario, BerryDunn used \$372, the combined individual and small group market (where annual benefit limits are not allowed because they are not applied in the ACA benchmark plan) paid unit cost for the carrier that applies an annual limit in the large group market, whose paid costs were among the lowest observed in the MA APCD in all market segments. Subtracting the \$270 average unit cost calculated for carrier policies subject to the \$350 annual limit from \$372 results in a low-cost scenario incremental unit cost for removing annual benefit limits of \$102. These results are summarized in Table 2.

**Table 2: Estimated Incremental Cost for Changes in Annual Limits**

	Unit Cost
Low Scenario	\$102
Mid Scenario	\$241
High Scenario	\$994

In 2015, there were a total of 48 units reported in the MA APCD for large group policies by the carrier that reported applying the \$350 annual benefit limit in the large group market. Multiplying this number of units by the unit cost scenarios in Table 2 yields the annual incremental cost for the additional units, as shown in Table 3.

**Table 3: Estimated Incremental Cost for Changes in Annual Limits for Carriers Responding to the BerryDunn S.B. 553 Survey**

	Annual Cost (Carriers Responding to the Survey)
Low Scenario	\$4,896
Mid Scenario	\$11,577
High Scenario	\$47,712

Projecting this expense over the analysis period requires applying an estimate of cost growth, or inflation, for hair prostheses. This analysis used the long-term average national projection for cost increases to durable medical equipment over the study period<sup>24</sup> to project costs. The average annual trend during the study period is 7.3%.

The 2015 baseline incremental cost is divided by the corresponding 19.9 million member months for carriers responding to the BerryDunn survey, and increased by the annual trend

factors to project the PMPM impact of eliminating annual dollar limits on hair prosthesis claim costs. Table 4 displays the results.

**Table 4: Estimated PMPM of Increased Expense Associated With Having No Annual Dollar Limit for Hair Prosthesis**

	Baseline	2019	2020	2021	2022	2023
Low Scenario	\$0.0002	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Mid Scenario	\$0.0006	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001
High Scenario	\$0.0024	\$0.003	\$0.003	\$0.004	\$0.004	\$0.004

## 5.2 Coverage for NCAH With 21-Hydroxylase Deficiency

The proposed mandate would require coverage for male pattern baldness in women caused by NCAH. Carriers responding to BerryDunn’s S.B. 553 survey did not indicate that hair prostheses are covered for this diagnosis, nor was NCAH reported as a primary diagnosis on any MA APCD hair prosthesis claims.

Prevalence of NCAH in the United States population is estimated at approximately 1 in 1,000 individuals.<sup>25</sup> In one study, 19% of women aged 40 – 49 with NCAH experienced male pattern baldness,<sup>26</sup> and the prevalence of male pattern baldness in women with the condition appeared to increase with age.<sup>27</sup>

BerryDunn’s research uncovered no statistics regarding the frequency of moderate to severe hair loss among women with NCAH or the effectiveness of standard NCAH treatment on this symptom, although literature suggests hyperandrogenic symptoms are often responsive to treatment.<sup>28</sup>

To account for this uncertainty, BerryDunn modeled a high-cost scenario estimate assuming 100% of fully-insured women under age 65 in the Massachusetts population covered by the carriers responding to the S.B. 553 survey with NCAH-related male pattern baldness would purchase a wig each year under the new mandate.

To estimate the size of this population, BerryDunn divided the 19.9 million fully-insured member months for members under age 65 reported in the MA APCD for the carriers responding to the survey by 12 to calculate an average monthly membership estimate for this population of 1.66 million. Next, BerryDunn divided the average monthly membership by 1,000 to calculate an estimated 1,655 members with NCAH. 52% of fully-insured membership for the carriers responding to the survey is female. Applying this factor to the count of members with NCAH results in an estimate of 861 women with NCAH. Multiplying this estimate by the 19% prevalence rate for male pattern baldness in women aged 40 – 49 with NCAH yields and estimated 164 women with NCAH-related hair loss.

In the high-cost scenario, BerryDunn made the highly conservative (that is, tending to raise the estimated cost of the proposed mandate) assumption that all 164 women experiencing NCAH-

related hair loss would purchase new wigs annually. In the middle, best estimate scenario, BerryDunn assumed that 50% of women with NCAH-related hair loss would purchase new wigs annually, and assumed 5% of affected women would purchase wigs annually in the low-cost scenario.

Table 5, below, displays the number of fully-insured women under age 65 covered by carriers responding to the S.B. 553 survey with NCAH-related hair loss estimated to purchase a wig each year in each scenario.

**Table 5: Estimated Number of Wigs Per Year Purchased by Women With NCAH-Related Hair Loss and Covered by Carriers Responding to the S.B. 553 Survey**

	Number of Wigs Per Year (Carriers Responding to the Survey)
Low Scenario	8
Mid Scenario	82
High Scenario	164

To calculate base year total carrier medical expense for NCAH-related hair loss over the population covered by carriers responding to the survey, BerryDunn multiplied the number of wigs in each scenario by the \$511 average paid 2015 unit cost for wigs calculated in section 5.1 for carriers responding to the survey who did not report applying an annual benefit limit. This results in the estimated incremental cost displayed in Table 6.

**Table 6: Estimated Incremental Cost for NCAH-Related Hair Loss for Carriers Responding to the BerryDunn S.B. 553 Survey**

	Annual Cost (Carriers Responding to the Survey)
Low Scenario	\$4,842
Mid Scenario	\$48,417
High Scenario	\$96,835

As noted above, literature searches identified little or no basis for setting the range of units covered under this provision of the proposed mandate. However, even under the extreme assumptions of the high-cost scenario, the base year estimated PMPM cost of the provision is \$0.0049. Given the marginal materiality of the incremental cost of NCAH-related hair loss even in the high-cost scenario, the uncertainty surrounding the range of utilization assumptions carries little risk.

Projecting this expense over the analysis period requires applying an estimate of cost growth, or inflation, for hair prostheses. This analysis used the long-term average national projection for cost increases to durable medical equipment over the study period<sup>29</sup> to project costs. The average annual trend during the study period is 7.3%.

The 2015 baseline incremental cost is divided by the corresponding 19.9 million member months for carriers responding to the BerryDunn survey, and increased by the annual trend factors to project the PMPM impact of NCAH-related hair loss on hair prosthesis claim costs. Table 7 displays the results.

**Table 7: Estimated PMPM of Increased Expense Associated With NCAH-Related Hair Loss**

	Baseline	2019	2020	2021	2022	2023
Low Scenario	\$0.0002	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Mid Scenario	\$0.0024	\$0.003	\$0.003	\$0.004	\$0.004	\$0.004
High Scenario	\$0.0049	\$0.006	\$0.007	\$0.007	\$0.008	\$0.009

### 5.3 Facial Pigmentation

The proposed mandate would require coverage for facial pigmentation including eyebrows and eyelashes. Results from a survey of Massachusetts insurance carriers indicates that one carrier covers facial pigmentation. However, no claim data for these services was available in the 2015 MA APCD.

This analysis assumes that those seeking coverage for facial pigmentation will be members with alopecia totalis and/or alopecia universalis. Publicly available literature indicates a combined prevalence rate for the two conditions of 0.036%.<sup>30</sup> The combined prevalence rate was multiplied by the number of people in the Massachusetts fully-insured population under age 65 covered by the carriers responding to the carrier survey, resulting in an estimate of 596 people with alopecia totalis or alopecia universalis. In the absence of data to inform an estimate of the number of people with these diagnoses who will seek treatment, BerryDunn made the conservative assumption that 100% of people with these diagnoses will seek treatment in the low- and middle-cost scenarios. Because of uncertainty regarding the number of people with alopecia totalis and universalis, the number of individuals seeking facial medical pigmentation was then doubled for the high-end scenario. Table 8 represents the number of units or claims in each scenario.

**Table 8: Estimated Number of Units for Facial Pigmentation for Carriers Responding to the Survey**

	<b>Number of Claims (Carriers Responding to the Survey)</b>
Low Scenario	596
Mid Scenario	596
High Scenario	1,192

To determine a unit cost range for these services, BerryDunn reviewed online marketing materials for providers of these services, such as salons, in the Massachusetts market, and cost information from the Society of Permanent Cosmetic Professionals.<sup>31</sup>

Over the five-year study period, BerryDunn assumed that each person would obtain coverage for an initial treatment of both eyebrows and eyelashes. On average, touch up services are done once per year; we therefore assumed that touch up work would be done in each of the other four years. BerryDunn calculated a weighted average unit cost based on this assumption. The weighted average cost accounts for a variety of potential temporal patterns of utilization in the absence of data to inform assumptions about pent-up demand, rates of treatment paid for out-of-pocket by members prior to the mandate, member awareness of new benefits, etc.

Table 9 displays the weighted average unit cost in each scenario.

**Table 9: Estimated Unit Cost for Facial Pigmentation**

	<b>Unit Cost</b>
Low Scenario	\$343
Mid Scenario	\$386
High Scenario	\$429

The unit costs from Table 9 were then multiplied by the estimated number of members expected to use the service from Table 8, resulting in the annual incremental costs for 2019 shown in Table 10.

**Table 10: Estimated Incremental Cost for Facial Pigmentation for Carriers Responding to the Survey**

	<b>Annual Cost (Carriers Responding to the Survey)</b>
Low Scenario	\$204,580
Mid Scenario	\$230,152
High Scenario	\$511,450

Projecting this expense over the analysis period requires applying an estimate of cost inflation for facial pigmentation. This analysis used 7.3, the long-term average national projection for cost increases to durable medical equipment over the study period,<sup>32</sup> to project costs.

The 2019 incremental cost is divided by the corresponding 19.9 million member months for carriers responding to the BerryDunn survey, and increased each year by the annual cost trend factor to project the PMPM impact of adding coverage for facial pigmentation. Table 11 displays the results.

**Table 11: Estimated Incremental PMPM Due to Requiring Coverage for Facial Pigmentation for Eyelashes and Eyebrows**

	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
Low Scenario	\$0.010	\$0.011	\$0.012	\$0.013	\$0.014
Mid Scenario	\$0.012	\$0.012	\$0.013	\$0.014	\$0.015
High Scenario	\$0.026	\$0.028	\$0.030	\$0.032	\$0.034

#### **5.4 Marginal Medical Expense Per Member Per Month**

Adding together the estimated PMPM costs associated with the three components of cost (from Tables 4, 7, and 11) yields the total PMPM incremental cost, shown in Table 12.

**Table 12: Estimated Marginal PMPM Medical Expense of Scalp and Facial Hair Prosthesis Mandate**

	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
Low Scenario	\$0.011	\$0.012	\$0.013	\$0.014	\$0.014
Mid Scenario	\$0.013	\$0.017	\$0.018	\$0.019	\$0.021
High Scenario	\$0.029	\$0.038	\$0.041	\$0.044	\$0.047

#### **5.5 Projected Fully-insured Population in Massachusetts**

Table 13 shows the fully-insured population in Massachusetts ages 0 to 64 projected for the next five years. Appendix A describes the sources of these values.

**Table 13: Projected Fully-insured Population in Massachusetts, Ages 0 – 64**

Year	Total (0 – 64)
2019	2,153,622
2020	2,149,554
2021	2,145,579
2022	2,141,700
2023	2,137,917

## 5.6 Total Marginal Medical Expense

Multiplying the total estimated PMPM costs from Table 12 by the projected fully-insured membership over the analysis period from Table 13 results in the total cost (medical expense) associated with the mandate, shown in Table 14. This analysis assumes the bill, if enacted, would be effective January 1, 2019.<sup>viii</sup>

**Table 14: Estimated Marginal Cost of Scalp and Facial Hair Prosthesis Mandate**

	2019	2020	2021	2022	2023
Low Scenario	\$201,600	\$302,765	\$324,272	\$347,332	\$371,986
Mid Scenario	\$233,358	\$430,866	\$461,550	\$494,465	\$529,604
High Scenario	\$537,755	\$977,437	\$1,047,404	\$1,122,526	\$1,202,490

## 5.7 Carrier Retention and Increase in Premium

Assuming an average retention rate of 11.2% based on CHIA’s analysis of administrative costs and profit in Massachusetts,<sup>33</sup> the increase in medical expense was adjusted upward to approximate the total impact on premiums. Table 15 shows the result.

<sup>viii</sup> The analysis assumes the mandate would be effective for policies issued and renewed on or after January 1, 2019. Based on an assumed renewal distribution by month, by market segment, and by the Massachusetts market segment composition, 71.3% of the member months exposed in 2019 will have the proposed mandate coverage in effect during calendar year 2017. The annual dollar impact of the mandate in 2017 was estimated using the estimated PMPM and applying it to 71.3% of the member months exposed.

**Table 15: Estimate of Increase in Carrier Premium Expense**

	2019	2020	2021	2022	2023
Low Scenario	\$227,148	\$341,133	\$365,366	\$391,348	\$419,126
Mid Scenario	\$262,930	\$485,468	\$520,041	\$557,126	\$596,718
High Scenario	\$605,902	\$1,101,303	\$1,180,137	\$1,264,778	\$1,354,876

## 6.0 Results

The estimated impact of the proposed mandate on medical expense and premiums appears below. 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 impact.

The impact on premiums is driven by the provisions of S.B. 553 removing the \$350 annual benefit limit, adding coverage for NCAH-related hair loss, and adding coverage for facial pigmentation.

Starting in 2022, the federal ACA will impose an excise tax, commonly known as the “Cadillac Tax,” on expenditures on health insurance premiums and other relevant items (health savings account contributions, etc.) that exceed specified thresholds. To the extent relevant expenditures exceed those thresholds (in 2020), S.B. 553, 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 S.B. 553, 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 16 displays the projected net impact of the mandate on medical expense and premiums using a projection of Massachusetts fully-insured membership. Note that the relevant provisions of S.B. 553 are assumed effective January 1, 2019.<sup>34</sup>

The low scenario impact is \$370,000 per year on average, and is due to the lower estimates of cost and utilization rates of facial pigmentation. The high scenario has an average cost of \$1,169,000 per year, and reflects higher costs and utilization rates for facial pigmentation. The middle scenario has average annual costs of \$514,000, or an average of 0.004% of premium.

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 mandate. In particular, plans currently not covering alopecia or applying dollar limits to hair prosthesis will likely see larger increases in medical expenses and premiums.

**Table 16: Summary Results**

	2019	2020	2021	2022	2023	Weighted Average	Five-Year Total
Members (000s)	2,154	2,150	2,146	2,142	2,138		
Medical Expense Low (\$000s)	\$202	\$303	\$324	\$347	\$372	\$329	\$1,548
Medical Expense Mid (\$000s)	\$233	\$431	\$462	\$494	\$530	\$456	\$2,150
Medical Expense High (\$000s)	\$538	\$977	\$1,047	\$1,123	\$1,202	\$1,037	\$4,888
Premium Low (\$000s)	\$227	\$341	\$365	\$391	\$419	\$370	\$1,744
Premium Mid (\$000s)	\$263	\$485	\$520	\$557	\$597	\$514	\$2,422
Premium High (\$000s)	\$606	\$1,101	\$1,180	\$1,265	\$1,355	\$1,169	\$5,507
PMPM Low	\$0.01	\$0.01	\$0.01	\$0.02	\$0.02	\$0.01	\$0.01
PMPM Mid	\$0.01	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02
PMPM High	\$0.03	\$0.04	\$0.05	\$0.05	\$0.05	\$0.05	\$0.05
Estimated Monthly Premium	\$493	\$502	\$512	\$523	\$533	\$513	\$513
Premium % Rise Low	0.003%	0.003%	0.003%	0.003%	0.003%	0.003%	0.003%
Premium % Rise Mid	0.003%	0.004%	0.004%	0.004%	0.004%	0.004%	0.004%
Premium % Rise High	0.007%	0.008%	0.009%	0.009%	0.010%	0.009%	0.009%

## 6.2 Impact on the GIC

The proposed mandate 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, 2019.

Because the benefit offerings of GIC plans are similar to those of most other commercial plans in Massachusetts, the estimated PMPM effect of the proposed mandate on GIC medical expense is not expected to differ from that calculated for the other fully-insured plans in Massachusetts.

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 2019.

Table 17 breaks out the GIC-only fully-insured membership and the GIC self-insured membership and 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 14 also include the GIC fully-insured membership. Finally, the proposed mandate is assumed to require the GIC to implement the provisions on July 1, 2019; therefore, the results in 2019 are approximately one-half of an annual value.

**Table 17: GIC Summary Results**

	2019	2020	2021	2022	2023	Weighted Average	Five-Year Total
<b>GIC Fully-insured</b>							
Members (000s)	54	54	54	53	53		
Medical Expense Low (\$000s)	\$4	\$8	\$8	\$9	\$9	\$8	\$37
Medical Expense Mid (\$000s)	\$4	\$11	\$12	\$12	\$13	\$12	\$52
Medical Expense High (\$000s)	\$9	\$24	\$26	\$28	\$30	\$26	\$118
Premium Low (\$000s)	\$4	\$9	\$9	\$10	\$10	\$9	\$42
Premium Mid (\$000s)	\$5	\$12	\$13	\$14	\$15	\$13	\$59
Premium High (\$000s)	\$11	\$28	\$29	\$32	\$34	\$30	\$133
<b>GIC Self-Insured</b>							
Members (000s)	269	269	268	267	267		
Medical Expense Low (\$000s)	\$18	\$38	\$40	\$43	\$46	\$41	\$186
Medical Expense Mid (\$000s)	\$20	\$54	\$58	\$62	\$66	\$58	\$260
Medical Expense High (\$000s)	\$47	\$122	\$131	\$140	\$150	\$131	\$590

## Appendix A: Membership Affected by the Proposed Mandate

Membership potentially affected by a proposed mandate may include Massachusetts residents with fully-insured employer-sponsored health insurance issued by a Massachusetts licensed company (including through the GIC), non-residents with fully-insured employer-sponsored insurance issued in Massachusetts, Massachusetts residents with individual (direct) health insurance coverage, and, lives covered by GIC self-insured coverage. BerryDunn's 2019 to 2023 membership projections for these populations are derived from the following sources.

The 2014 Massachusetts All Payer Claim Database (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 Massachusetts policy. These are typically cases in which a non-resident works for a Massachusetts employer offering employer-sponsored coverage. Adjustments were made to the data for membership not in the MA APCD, based on published membership reports available from the Massachusetts CHIA and the Massachusetts Department of Insurance (DOI).

CHIA publishes a quarterly enrollment trends report and supporting databook (enrollment-trends-july-2016-databook<sup>35</sup>), which provides enrollment data for Massachusetts 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 their enrollment trends reports and provided BerryDunn with details regarding the use of supplemental carrier information for their December 2014 reported enrollment. The supplemental data was used to adjust the resident totals from the MA APCD.

The DOI publishes a report titled Quarterly Report of Health Maintenance Organization Membership in Closed Network Health Plans as of December 31, 2014<sup>36</sup> and Massachusetts Division of Insurance Annual Report Membership in MEDICAL Insured Preferred Provider Plans by County as of December 31, 2014<sup>37</sup>. These reports provide fully-insured covered members for licensed Massachusetts insurers where the member's primary residence is in Massachusetts. 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.<sup>38</sup> Membership was projected forward from the 2014 base year to 2015 using the American Community Survey<sup>39</sup>, and then from 2015 through 2021 using Census Bureau population growth rate estimates by age and gender.<sup>40</sup>

Projections for the GIC self-insured lives were developed using GIC base data for 2014,<sup>41</sup> and 2015,<sup>42</sup> and the same projected growth rates from the Census Bureau that were used for the Massachusetts population. Breakdowns of the GIC self-insured lives by gender and age were based on the Census Bureau distributions.

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## Endnotes

<sup>1</sup> The 190<sup>th</sup> General Court of the Commonwealth of Massachusetts, Senate Bill 553, “An Act providing health insurance coverage for scalp and facial hair prosthesis.” Accessed 26 December 2017: <https://malegislature.gov/Bills/190/S553>.

<sup>2</sup> Hunt N. The psychological impact of alopecia. *BMJ*. 2005 Oct 22; 331(7522): 951–953. Accessed 17 January 2018: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1261195/>.

<sup>3</sup> American Academy of Dermatology. Do you have hair loss or hair shedding? Accessed 17 January 2018: <https://www.aad.org/public/skin-hair-nails/hair-care/hair-loss-vs-hair-shedding>.

<sup>4</sup> *Op cit.* American Academy of Dermatology. Do you have hair loss or hair shedding?

<sup>5</sup> *Op cit.* American Academy of Dermatology. Do you have hair loss or hair shedding?

<sup>6</sup> *Op cit.* American Academy of Dermatology. Do you have hair loss or hair shedding?

<sup>7</sup> <sup>7</sup> *Op cit.* American Academy of Dermatology. Do you have hair loss or hair shedding?

<sup>8</sup> *Op Cit.* Hunt N and McHale S.

<sup>9</sup> *Op Cit.* Hunt N and McHale S.

<sup>10</sup> *Op Cit.* Hunt N and McHale S.

<sup>11</sup> *Op Cit.* Hunt N and McHale S.

<sup>12</sup> Rodgers A. Why Finding a Treatment for Alopecia Areata Is Important: A Multifaceted Perspective. [http://www.jidsponline.org/article/S1087-0024\(17\)30041-2/fulltext](http://www.jidsponline.org/article/S1087-0024(17)30041-2/fulltext).

<sup>13</sup> *Op Cit.* Dana-Farber Cancer Institute. For Patients & Families. Wigs and Hair Prostheses for Cancer.

<sup>14</sup> Goldman, A and Wollina U. Severe unexpected adverse effects after permanent eye makeup and their management by Q-switched Nd:YAG laser. Accessed 19 January 2018 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4136952/>.

<sup>15</sup> De Cuyper C. Permanent Makeup: Indications and complications. *Clin Dermatol*. 2008 Jan-Feb;26(1):30-4. Accessed 19 January 2018: <https://www.ncbi.nlm.nih.gov/pubmed/18280902>

<sup>16</sup> *Op Cit.* Goldman A and Wollina U.

<sup>17</sup> M.G.L. 32A, 175, 176A, 176B, 176G

<sup>18</sup> M.G.L. c.175 §47Z; c.176A §8AA; c.176B §4AA; c.176G §4S; c.32A §17I

<sup>19</sup> Massachusetts Health Connector. Accessed 17 January 2018: <https://www.mahealthconnector.org/>.

<sup>20</sup> Massachusetts Center for Health Information and Analysis. Massachusetts All Payer Claims Database. Accessed 17 January 2018: <http://www.chiamass.gov/ma-apcd/>.

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- <sup>21</sup> Permanent Make UP FAQ: Society of Permanent Cosmetic Professionals Accessed 19 January 2018: <https://www.spcp.org/thinking-of-getting-a-cosmetic-tattoo/permanent-makeup-faq/>
- <sup>22</sup> NIH U.S. National Library of Medicine. Genetics Home Reference. Your Guide to Understanding Genetic Conditions. Accessed 17 January 2018: <https://ghr.nlm.nih.gov/condition/21-hydroxylase-deficiency#inheritance>.
- <sup>23</sup> Trapp CM and Oberfield SE. Recommendations for Treatment of Nonclassic Congenital Adrenal Hyperplasia (NCCAH): an Update. *Steroids*. 2012 Mar 10; 77(4): 342–346. Accessed 22 January 2018: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3638754/#R43>.
- <sup>24</sup> U.S. Centers for Medicare and Medicaid Services (CMS), Office of the Actuary. National Health Expenditure Projections. Table 15, Durable Medical Equipment; Aggregate and per Capita Amounts, Percent Distribution and Annual Percent Change by Source of Funds: Calendar Years 2009-2025; Private Insurance. Accessed 27 December 2017: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsProjected.html>.
- <sup>25</sup> NIH U.S. National Library of Medicine. Genetics Home Reference. Your Guide to Understanding Genetic Conditions. Accessed 17 January 2018: <https://ghr.nlm.nih.gov/condition/21-hydroxylase-deficiency#inheritance>.
- <sup>26</sup> Trapp CM and Oberfield SE. Recommendations for Treatment of Nonclassic Congenital Adrenal Hyperplasia (NCCAH): an Update. *Steroids*. 2012 Mar 10; 77(4): 342–346. Accessed 22 January 2018: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3638754/#R43>.
- <sup>27</sup> *Ibid.*
- <sup>28</sup> *Ibid.*
- <sup>29</sup> U.S. Centers for Medicare and Medicaid Services (CMS), Office of the Actuary. National Health Expenditure Projections. Table 15, Durable Medical Equipment; Aggregate and per Capita Amounts, Percent Distribution and Annual Percent Change by Source of Funds: Calendar Years 2009-2025; Private Insurance. Accessed 27 December 2017: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsProjected.html>.
- <sup>30</sup> Prevalence of rare diseases: Bibliographic data », Orphanet Report Series, Rare Diseases collection, June 2017, Number 1 : Diseases listed in alphabetical order. Accessed 18 January 2018: [http://www.orpha.net/orphacom/cahiers/docs/GB/Prevalence\\_of\\_rare\\_diseases\\_by\\_diseases.pdf](http://www.orpha.net/orphacom/cahiers/docs/GB/Prevalence_of_rare_diseases_by_diseases.pdf).
- <sup>31</sup> Permanent Make UP FAQ: Society of Permanent Cosmetic Professionals Accessed 19 January 2018: <https://www.spcp.org/thinking-of-getting-a-cosmetic-tattoo/permanent-makeup-faq/>
- <sup>32</sup> U.S. Centers for Medicare and Medicaid Services (CMS), Office of the Actuary. National Health Expenditure Projections. Table 15, Durable Medical Equipment; Aggregate and per Capita Amounts, Percent Distribution and Annual Percent Change by Source of Funds: Calendar Years 2009-2025; Private Insurance. Accessed 27 December 2017: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsProjected.html>.

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Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsProjected.html.

<sup>33</sup> Massachusetts Center for Health Information and Analysis. Annual Report on the Massachusetts Health Care System, September 2017. Accessed 27 December 2017: <http://www.chiamass.gov/annual-report>.

<sup>34</sup> With an assumed start date of January 1, 2019, dollars were estimated at 70.7% of the annual cost, based upon an assumed renewal distribution by month (Jan through Dec) by market segment and the Massachusetts market segment composition.

<sup>35</sup> 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/](http://www.chiamass.gov/enrollment-in-health-insurance/)

<sup>36</sup> 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>

<sup>37</sup> Massachusetts Department of Insurance. membership 2014. Accessed 22 September 2016 <http://www.mass.gov/ocabr/docs/doi/managed-care/prefprov/2014-prefprov2.pdf>

<sup>38</sup> 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>

<sup>39</sup> American Factfinder U.S. Census Bureau, Annual estimate of populations. Accessed 22 September 2016 [http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP\\_2015\\_PEPANNRES&src=pt](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP_2015_PEPANNRES&src=pt)

Methodology described <http://www.census.gov/popest/methodology/2015-natstcopr-meth.pdf>

<sup>40</sup> 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>

<sup>41</sup> Group Insurance Commission. GIC Health Plan Membership by Insured Status FY2014. Accessed 28 March 2016: <http://www.mass.gov/anf/docs/gic/annual-report/fy2014annual-report.pdf>.

<sup>42</sup> Group Insurance Commission, Group Insurance Commission Fiscal Year 2015 Annual Report. Accessed 25 January 2016: <http://www.mass.gov/anf/docs/gic/annual-report/gic-annual-reportfy15.pdf>.