Skin Cancer Prevention

Jameson T. Loyal

University of Vermont College of Medicine

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Skin Cancer Prevention

Family Medicine Clerkship – Hinesburg, Vermont
February/March 2016

Jameson T. Loyal

Mentor: Michelle Cangiano, MD

The University of Vermont
College of Medicine
Problem

- Skin cancer is the most common type of cancer in the US.
  - Approximately 5 million adults are treated for skin cancer (basal cell carcinoma, squamous cell carcinoma, melanoma) annually.
  - Basal cell carcinoma is the most common form of skin cancer with approximately 2.8 million cases per year annually.
    - Approximately 3,000 deaths are due to basal cell carcinoma annually in the US.
  - Squamous cell carcinoma is the second most common skin cancer with approximately 700,000 cases annually.
    - Approximately 4,000-9,000 deaths are due to squamous cell carcinoma in the US in 2012.
  - Melanoma is the second most common cause of cancer death in those 15-29 years old.
    - 67,000 new cases of melanoma nationwide in 2012.
      - 9,000 melanoma-related deaths nationwide in 2012.
    - Estimated to be approximately 144,860 new cases of melanoma diagnosed nationwide in 2016.
      - Estimated to be approximately 10,130 melanoma-related deaths nationwide in 2016.
  - Melanoma is the 5th most common cancer diagnosed in Vermont.
    - Approximately 114 melanomas are diagnosed in Vermont men annually.
    - Approximately 95 melanomas are diagnosed in Vermont women annually.
    - Melanoma incidence rate among Vermonters is higher than the US as a whole; however, the melanoma death rate is not much different than the national average.
    - Bennington County had the highest incidence of melanoma of all counties in Vermont (1.4 times higher) than other locations in Vermont.

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<thead>
<tr>
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<th>Rate</th>
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<td>US (total)</td>
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<thead>
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<th>Rate</th>
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<tr>
<td>Utah</td>
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<td>Colorado</td>
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<td>Kentucky</td>
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<tr>
<td>Vermont</td>
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</table>
Problem

- About 90% of non-melanoma skin cancers and about 65% of melanomas are attributable to ultraviolet radiation from the sun and/or indoor tanning devices.
- 31% of adults reported wearing sunscreen of SPF 15 or higher in 2010.
- 9% of Vermont high school students reported using a tanning bed or sunlamp with 15% of high school girls and 4% of high school boys endorsing this use (Youth Risk Behavior Survey 2011).
- 16% of high school students reported wearing sunscreen (SPF of 15 or greater) always or most of the time. 10% of high school males and 23% of high school females reported wearing sunscreen always or most of the time (Youth Risk Behavior Survey 2013).
- 80% of sun damage occurs before age 21.
- Doctors mention the use of sunscreen in 0.07% of patient visits.

Need

- The number of adults treated for skin cancer nationally increased by 44% from 2002 to 2011. The number of adults treated for other cancers increased 32% nationally during the same time period.
- Based on the data presented it is clear that an intervention is needed to reduce the number of skin cancer cases in the state of Vermont.
- The low numbers of reported sunscreen usage especially among the youth and the number of reported sunburns is alarming.
- At the Hinesburg Family Medicine Practice there was no educational resources for patients regarding skin cancer, tanning dangers, and ways to protect the skin from UV radiation.
- There is currently no standardized way to document suspicious skin findings in the electronic medical record.

<table>
<thead>
<tr>
<th>County/State</th>
<th>5-year Count</th>
<th>Average Annual Count</th>
<th>Age-Adjusted Incidence Rate</th>
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<td>Vermont (state-wide)</td>
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<td>215.4</td>
<td>29.0</td>
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<tr>
<td>Addison</td>
<td>54</td>
<td>10.8</td>
<td>23.7</td>
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<tr>
<td>Bennington</td>
<td>81</td>
<td>16.2</td>
<td>32.4</td>
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<tr>
<td>Caledonia</td>
<td>46</td>
<td>9.2</td>
<td>23.9</td>
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<td>Chittenden</td>
<td>258</td>
<td><strong>51.6</strong></td>
<td><strong>32.4</strong></td>
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<td>Essex</td>
<td>15</td>
<td>3</td>
<td>37.7</td>
</tr>
<tr>
<td>Franklin</td>
<td>60</td>
<td>12</td>
<td>23.0</td>
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<tr>
<td>Grand Isle</td>
<td>22</td>
<td>4.4</td>
<td>48.1</td>
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<tr>
<td>Lamoille</td>
<td>48</td>
<td>9.6</td>
<td>34.6</td>
</tr>
<tr>
<td>Orange</td>
<td>50</td>
<td>10</td>
<td>29.0</td>
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<td>Orleans</td>
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<td>18.6</td>
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<td>Rutland</td>
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<td>18.8</td>
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<td>Washington</td>
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<td>Windsor</td>
<td>128</td>
<td>25.6</td>
<td>35.2</td>
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</table>

<table>
<thead>
<tr>
<th>Percentage of Vermonters Reporting Sunburn within One Year (2013)</th>
</tr>
</thead>
<tbody>
<tr>
<td>At least one sunburn</td>
</tr>
<tr>
<td>16%</td>
</tr>
</tbody>
</table>
Public Health Cost

• **Annual treatment cost of skin cancer** in the United States from 2007-2011 was **$8.4 billion**.
  - Non-melanoma Skin Cancer: $4.8 billion
  - Melanoma Skin Cancer: $3.3 billion
• **Average years of potential life lost per death due to Melanoma:** 15 years
  - 5-year survival rate for melanoma detected and treated early: 98%
  - 5-year survival rate for melanoma that has regional spread: 62%
  - 5-year survival rate for melanoma that has distant spread: 16%
• **Average years of potential life lost per death due to non-melanoma skin cancer:** 10 years

### Years of Potential Life Lost due to Melanoma in United States, 2000 (Yabroff et al)

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Average Years of Potential Life Lost</th>
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</thead>
<tbody>
<tr>
<td>Men aged &lt;65 years</td>
<td>26.8</td>
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<tr>
<td>Men aged ≥65 years</td>
<td>9.3</td>
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<tr>
<td>Women aged &lt;65 years</td>
<td>36.1</td>
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<tr>
<td>Women aged ≥65 years</td>
<td>11.4</td>
</tr>
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</table>

### Value of Life Lost due to Melanoma in United States, 2000 (Yabroff et al)

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Billions of Dollars</th>
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<td>Men aged &lt;65 years</td>
<td>6.0</td>
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<td>Men aged ≥65 years</td>
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<tr>
<td>Women aged &lt;65 years</td>
<td>3.8</td>
</tr>
<tr>
<td>Women aged ≥65 years</td>
<td>2.2</td>
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### Direct and Indirect Cost of Skin Cancer in the United States, 2004 (Bickers et al)

<table>
<thead>
<tr>
<th></th>
<th>Direct Cost</th>
<th>Cost due to Lost Productivity</th>
<th>Intangible Cost due to Loss of Quality of Life</th>
<th>Inpatient Services Cost</th>
<th>Outpatient Services Cost</th>
<th>Emergency Department Costs</th>
<th>Office Visits Costs</th>
<th>Prescription Drug Costs</th>
<th>Cost due to Lost Workdays</th>
<th>Cost due to Restricted Activity Days</th>
<th>Cost due to Caregiver Lost Workdays</th>
<th>Foregone Future Earnings due to Premature Death</th>
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</thead>
<tbody>
<tr>
<td>All Costs in $ millions</td>
<td>Direct Cost</td>
<td>Cost due to Lost Productivity</td>
<td>Intangible Cost due to Loss of Quality of Life</td>
<td>Inpatient Services Cost</td>
<td>Outpatient Services Cost</td>
<td>Emergency Department Costs</td>
<td>Office Visits Costs</td>
<td>Prescription Drug Costs</td>
<td>Cost due to Lost Workdays</td>
<td>Cost due to Restricted Activity Days</td>
<td>Cost due to Caregiver Lost Workdays</td>
<td>Foregone Future Earnings due to Premature Death</td>
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<td>Non-melanoma Skin Cancer</td>
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<td>961</td>
<td>130</td>
<td>65</td>
<td>162</td>
<td>1</td>
<td>1205</td>
<td>19</td>
<td>24.5</td>
<td>25.4</td>
<td>17.7</td>
<td>893.2</td>
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</table>
Community Perspective

Joseph C. Pierson, MD – Department of Dermatology, University of Vermont Medical Center:

Q: Vermont has one of the highest rates of skin cancer (particularly melanoma) in the country. Why is that so?
A: The combination of the population being very fair in complexion coupled with many individuals being outdoor enthusiasts particularly near water and snow (both reflecting UV rays at a high rate).

Q: What do you think is the solution to bring down skin cancer rates in Vermont?
A: Outlawing tanning beds before the age of 18 will have an impact as could having more campaigns for sun safe behaviors for the public.

Q: What are 2-3 important things for patients to know about skin cancer and how to prevent it?
A: Sunscreen is only part of the preventative regimen; importance of protective eyewear, hats and clothing in addition to seeking shaded areas and reapplying sunscreen when in water and/or perspiring; if one is going to do lots of outdoor activities limit it to early in the day (before 10AM) or after 4PM to limit sun exposure.

Michael Sirois, MD – Department of Family Medicine, University of Vermont College of Medicine:

Q: Vermont has one of the highest rates of skin cancer (particularly melanoma) in the country. Why is that so?
A: The population is light skinned and the state has infrequent blasts of sunny days. Furthermore, the perception that the sun is not strong in Vermont has an impact and the overall lack of sun safety educational campaigns particularly in the rural communities.

Q: What do you think the solution is to bring down skin cancer rates in Vermont?
A: Adopting an informed consent form when an individual uses tanning beds explaining the risks and potential for skin cancer and better education especially for more rural populations.

Q: Is there a need for better skin cancer education for patients?
A: Yes; a succinct educational pamphlet that can be part of the electronic medical record and printed for patients would be useful.

Q: What are 2-3 important things for patients to know about skin cancer and how to prevent it?
A: Tanning beds increases one’s risk for skin cancer; risks of sunburns and how to prevent them; how all skin types are affected by skin cancer.
Justin Pentenrieder – Health Systems Manager, American Cancer Society – New England Division:

Q: Have you seen any trends in skin cancer in Vermont?
A: The banning of tanning bed usage for individuals under the age of 18 will hopefully have an impact. Furthermore, there has been campaigns, particularly in high school students, to forego tanning prior to special events such as the high school prom.

Q: What is the role of the American Cancer Society in educating, preventing, and caring for patients with skin cancer?
A: The American Cancer Society has public awareness campaigns for skin cancer especially in the month of May for skin cancer awareness month. Furthermore, in the months of June and July the American Cancer Society has many Relay for Life events for different cancers and skin cancer awareness is always part of these events. Finally, patients should know that the American Cancer Society helps care for patients with all cancers, including skin cancer, in various ways such as: providing information from a nursing staff through our 24/7 helpline 1-800-227-2345, coordinating free accommodations at the Hope Lodge for patients and their families receiving cancer treatment, providing emotional support and support groups, and helping to coordinate community efforts like arranging transportation for patients to go to their treatment appointments.

Q: What does the American Cancer Society want the public to know about skin cancer?
A: Skin cancer can happen to anyone and that many skin cancers can be prevented by behavioral changes.

Q: What are 2-3 things that should be included in an informational brochure for skin cancer and prevention?
A: Information on prevention and early detection, examples of what to look for in skin cancer, and ways to lower one’s risk.

Sharon Mallory - Comprehensive Cancer Control Program Director, Vermont Department of Health:

Q: Vermont has one of the highest rates of skin cancer (particularly melanoma) in the country. Why is that so?
A: Vermont has an older population. Furthermore, short bursts of UV radiation contributes.

Q: What is the role of the Health Department in educating, preventing, controlling, and caring for patients with skin cancer?
A: The Health Department monitors the burden of melanoma and also monitors the population’s behavior in terms of both sun exposure and ways to limit UV radiation (such as with sunscreen usage). Outlawing the usage of tanning beds for those under the age of 18 years old has also led other states in the country to look at Vermont on how to pass similar such laws in their own states.

Q: What are 2-3 things that should be included in an informational brochure for skin cancer and prevention?
A: Sun exposure risk in the Winter and explaining that Vermont has a high rate of melanoma. In addition, for a future project having a school-based youth program about sun safety and the dangers of UV radiation would be beneficial to the community but has been difficult to implement.
Intervention

- It is clear from the research and perspectives from different community experts that skin cancer is a major problem for the Vermont community. Furthermore, a key element that was revealed was the importance of education with regard to skin cancer and its prevention.
- The goal of this project was to create a comprehensive informational brochure that would include information on:
  - Key facts and clinical characteristics of melanoma, basal cell carcinoma, actinic keratosis, and squamous cell carcinoma
  - Information on the danger of tanning and helpful strategies to lower one’s UV exposure while outside
  - Helpful hints about sunscreen and its application
  - Mole tracker: easy way for patients to document location and characteristics of concerning skin lesions to remember to have their physician look at their skin at their next appointment.
- Information for the brochure was researched from the American Academy of Dermatology, Centers for Disease Control and Prevention, American Cancer Society, and American Academy of Family Physicians.
- A survey to determine patients’ knowledge about skin cancer, the importance of sunscreen, and effectiveness of the informational brochure was also created and distributed with the brochure.
- An abbreviated version of the informational brochure highlighting skin cancer prevention was created as a smart phrase for the Prism Electronic Medical Record for physicians to quickly and easily include in the patient instruction print out at the end of a medical visit.
- A skin lesion history and documentation smart phrase was created for the Prism Electronic Medical Record for physicians to quickly take a skin history and accurately document skin lesions in their progress note.

Methodology

- The informational brochure along with the survey was distributed to patients at the check-in desk at Hinesburg Family Medicine Practice, University of Vermont Medical Center.
- Patients would review the informational brochure and then complete the survey while waiting to be seen by the physician.
- Physicians in the practice were made aware of both the skin care informational smart phrase for patient education along with the skin history and lesion documentation smart phrase to implement in their daily practice.
Tanning dangers:
- All tanning is dangerous.
- Tanned skin = damaged skin
- Ultraviolet radiation emitted by the sun and tanning beds is recognized as causing cancer.
- American Academy of Dermatology recommends obtaining vitamin D through diet or supplements and not sun exposure.
- Vermont outlawed indoor tanning for those under the age of 18 in 2012.
- Sun's UV rays strongest between 10AM-2PM—seek shade.
- Sun's UV rays are intensified near water, snow, and sand.
- Clouds, rain, and snow do not block the sun's harmful rays—use sunscreen.

Sunscreen:
- Apply broad-spectrum, water-resistant sunscreen with sun protection factor (SPF) of 30 or greater to all sun exposed skin 30 minutes before going outside.
- To cover entire body use a palm full (1 ounce) of sunscreen.
- Reapply every 2 hours especially after swimming or perspiring.
- Protect lips with lip balm with SPF of 30 or greater.
- Wear long-sleeved shirts, pants, wide-brimmed hats, and sunglasses for added protection.

Mole tracker:

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<thead>
<tr>
<th>Name</th>
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<th>Evolution?</th>
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Self skin checks saves lives:
Remember to examine areas of your body that are difficult to check such as the scalp, ears, genitals, and buttocks.

Additional resources:
- www.cancer.org
- www.SpotSkinCancer.org
- www.spotme.org
- American Academy of Dermatology:
  - www.aad.org
  - www.facebook.com/AADskin
  - www.twitter.com/AADskin
- EPA Local UV Alerts & Recommendations:
  - www.epa.gov/sunwise/uvindex.html
MELANOMA

FACTS & STATS:
- Melanoma is a type of skin cancer that occurs in melanocytes, cells in the skin that give skin its color.
- Can spread quickly and kill if not caught early; most deadly skin cancer.
- Having at least 1 severe, blistering sunburn increases one's risk of melanoma.
- Having many (>50) moles increases risk.
- Every hour 1 person dies from melanoma.

DETECT & PREVENT:
- 90% of melanomas are due to ultraviolet rays from the sun & tanning devices; a preventable risk factor.
- Most common places to detect is: back, torso, legs, face, scalp, neck, and sometimes nails, mouth, genitals, and eyes.
- ABCDE's of Melanoma:
  - Asymmetry: one part is different from the other part
  - Border: irregular, scalloped borders
  - Color: shades of various colors (tan, black, red, white, blue)
  - Diameter: >6mm (bigger than a pencil eraser)
  - Evolving: changing over time or looks different than other marks on the skin

Basal, Cell Carcinoma

FACTS & STATS:
- Basal cell carcinoma starts in the outermost layer of the skin.
- Most common and least dangerous form of skin cancer.
- Slow growing; rarely spreads but can grow deep and wide causing destruction of skin and bone if left untreated.
- When caught early and removed, has excellent prognosis.

DETECT & PREVENT:
- Most appear on the scalp, neck, hands, nose, cheeks, and forehead.
- Usually dome-shaped growths with visible small blood vessels. Often shiny, pearly pink but can be brown, black, white, and/or yellow in color.
- Can have rolled edges and/or sunken centers.
- Can ooze or crust over. Bleeds easily with poor healing.

Actinic Keratosis

FACTS & STATS:
- Pre-cancerous growth that can develop into squamous cell carcinoma if left untreated.
- Caused by years of sun exposure.

DETECT & PREVENT:
- Typically forms on the face, forehead, scalp, lips, ears, neck, chest, back, and hands.
- Tends to be dry, scaly, and rough in texture. Can appear as red bumps or crusted growths in colors that range from red, yellow, black and brown.
- Usually pin-sized to quarter-sized.

Squamous Cell Carcinoma

FACTS & STATS:
- Develop from actinic keratosis.
- Second most common skin cancer.
- Has potential to spread.
- Excellent cure rates with early detection.

DETECT & PREVENT:
- Typically develops on face, ears, lips, hands, arms, and legs. Less common in mouth and on genitals.
- Presents as a bump that is crusty and rough. Can be red in color and bleeds easily. Heals poorly or if heals will return quickly.
Healthy Skin Brochure Questionnaire

Please answer the following questions by circling your response below. Thank You!

1.) Do you think that exposure to the sun increases a person’s chances of getting cancer?
   - A lot
   - A little
   - Not at all
   - Don’t know

2.) How often do you worry about getting skin cancer?
   - All the time
   - Often
   - Sometimes
   - Rarely or Never

3.) How often do you regularly use sunscreen to protect your skin from the sun?
   - All the time
   - Often
   - Sometimes
   - Rarely or Never

4.) How helpful was this brochure in educating you about skin cancer?
   - 1
   - 2
   - 3
   - 4
   - 5
   - 6
   - 7
   - 8
   - 9
   - 10
   - Not helpful
   - Somewhat helpful
   - Mostly helpful
   - Very helpful

5.) Would you be interested in going to an educational seminar on the topic of skin cancer and ways to protect your skin?
   - Yes
   - Possibly
   - No

6.) Did this brochure have any impact on your answer to Question #5?
   - Yes
   - Possibly
   - No

7.) Does this brochure make you want to discuss your skin health at your next wellness exam?
   - Yes
   - Possibly
   - No

8.) Did you learn anything new about skin cancer and/or prevention from this brochure?
   - Yes
   - Possibly
   - No

Comment:

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**SKIN HEALTH INFORMATION**

**Sun Protection Recommendations:**
- Sun’s UV rays strongest between 10AM-2PM – seek shade.
- Sun’s UV rays are intensified near water, snow, and sand – use sunscreen.
- Clouds, rain, and snow do not block the sun’s harmful rays – use sunscreen.
- Apply broad-spectrum, water-resistant sunscreen with sun protection factor (SPF) of 30 or greater to all sun exposed skin 30 minutes before going outside.
- To cover entire body use a palm full (1 ounce) of sunscreen.
- Reapply sunscreen every 2 hours especially after swimming or perspiring.
- Protect lips with lip balm with SPF of 30 or greater.
- Wear long-sleeved shirts, pants, wide-brimmed hats, and sunglasses for added protection.
- American Academy of Dermatology recommends obtaining vitamin D through diet or supplements and not sun exposure.

**Skin Cancer Prevention:**
- All tanning is dangerous; tanned skin = damaged skin.
- Ultraviolet radiation emitted by the sun and tanning beds is recognized as causing cancer.
- Having at least 1 severe, blistering sunburn increases one’s risk of melanoma.
- Vermont outlawed indoor tanning for those under the age of 18 in 2012.
- **ABGDE’s of Melanoma:** examine moles or other skin lesions
  - Asymmetry: one part is different from the other part
  - Border: irregular, scalloped borders
  - Color: shades of various colors (tan, black, red, white, blue)
  - Diameter: >6mm (bigger than a pencil eraser)
  - Evolving: changing over time or looks different than other marks on the skin

**Additional Resources:**
- www.cancer.org
- www.SpotSkinCancer.org

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Abbreviated Skin Health Information for Patient Instruction Section of the EMR.
SmartPhrase: SKINHEALTHFM
Skin Lesion History and Exam SmartPharse to be incorporated into note.
SmartPhrase: SKINHX

Locating SmartPhrases Instructions:
Epic → My SmartPhrases → Open → User: “Loyal, Jameson” → SKINHEALTHFM or SKINHX → Copy SmartPhrase → Go to your SmartPhrases → New → Paste SKINHEALTHFM or SKINHX SmartPhrase

Video of Skin Lesion History and Exam SmartPharse Illustrating easy drop-down menu with prepopulated options for a quick, easy, efficient, and accurate way to document skin lesions in the progress note.
SmartPhrase: SKINHX
Results & Data

- Over a two-week period 30 completed surveys about the healthy skin brochure were completed by adult patients.

Do you think that exposure to the sun increases a person’s chances of getting cancer?

How often do you worry about getting skin cancer?

How often do you regularly use sunscreen to protect your skin from the sun?
How helpful was this brochure in educating you about skin cancer?

Did you learn anything new about skin cancer and/or prevention from his brochure?

Does this brochure make you want to discuss your skin health at your next wellness exam?
Evaluation of Effectiveness

- 53% of respondents reported that the brochure was “mostly helpful” and 40% of respondents reported that the brochure was “very helpful” in educating them about skin cancer.
- 27% of respondents reported that the brochure made them want to discuss skin health at their next wellness exam.
- 43% of respondents reported that the brochure possibly will have an impact on them initiating a discussion about skin health at their next wellness exam.
- 47% of respondents reported that the brochure taught them something new about skin cancer and/or prevention. 30% of respondents reported that the brochure possibly taught them something new.
- 63% of respondents reported that the sun has a major impact on one’s risk of getting skin cancer; however, only 27% and 17% of respondents reported that they use sunscreen often or all the time, respectively.
- 57% of respondents reported that they sometimes worry about skin cancer.
- It is clear from the brochure’s survey that patients need more education about skin cancer prevention, particularly sunscreen use. Furthermore, it is clear that a brochure format is an easy and effective way to educate patients on topics such as skin cancer and its prevention.

Limitations

- Small cohort of experts interviewed due to time limitations to gather a broad spectrum view of important facts for brochure.
- No follow-up with experts for opinion on brochure.
- Small cohort for distribution of brochure and survey.
- With short appointment times it was often difficult for patients to review the brochure with the other paperwork that they needed to complete for the visit.
- Difficult to include pictures on electronic medical record version of skin cancer prevention information for patients.
- Difficulty in implementing new smart phrases for electronic medical record into regular use.
Recommendations

• Send brochure with annual physical forms to patients’ home for more time to review information.
• Coordinate with University of Vermont Medical Center electronic medical record professionals to create a more streamlined smart phrase for skin cancer history and lesion documentation.
• Coordinate with University of Vermont Medical Center electronic medical record professionals to create a button to print skin cancer prevention information easily as is similarly employed for other conditions such as after-care following a procedure.
• Host an informational session on skin cancer and ways to protect one’s skin.
• Make a young adult-friendly version of the information packet since melanoma is the second most common cancer in the 15-29 age group.
• Create a child friendly coloring book on ways to protect the skin from the sun.
• Coordinate with schools to create a sun safety and skin health program for elementary, middle, and high school students.
• Offer information in various forms such as a simple video or social media post to engage patients of all ages and learning styles.
References


4) Mitka M. Survey finds physicians rarely advise use of sunscreen to patients, even those most at risk for skin cancer. JAMA 2013; 10(13): 1328.


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41) Mallory S. March 7, 2016. Phone Interview.