Supplementary Document: Risk Calculator Coefficients

To predict the risk of infection/skin necrosis, add up the corresponding numbers:

\[
\text{BMI} \times 0.0434122668 \\
+ (\text{Number of LN sampled} \times 0.0143117981) \\
+ (\text{Number of malignant LN} \times 0.0180888727) \\
+ 1.1095921306 \text{ if patient is active smoker} \\
+ 0.176536806 \text{ if patient is ex-smoker} \\
+ 0.5557260193 \text{ if patient has diabetes} \\
+ 0.6250013562 \text{ if patient received RT with boost} \\
- 0.372165765 \text{ if patient received RT without boost} \\
+ 0.5417726424 \text{ if patient received proton} \\
+ 0.739082144 \text{ if patient had two stages reconstruction type} \\
- 0.02661184 \text{ if patient had TRAM} \\
- 0.756921696 \text{ if patient had DIEP or Latissimus} \\
+ 1.0480908072 \text{ if reconstruction time was immediate} \\
+ 0.5362335028 \text{ if patient had periareolar incisions} \\
+ 0.1355477404 \text{ if patient had horizontal or inferior radial incisions}
\]

The risk of infection/skin necrosis as a function of Total Score

<table>
<thead>
<tr>
<th>TOTAL SCORE</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk</td>
<td>0.004</td>
<td>0.01</td>
<td>0.03</td>
<td>0.08</td>
<td>0.19</td>
<td>0.39</td>
<td>0.63</td>
<td>0.82</td>
<td>0.93</td>
<td>0.97</td>
<td>0.99</td>
</tr>
</tbody>
</table>

Example 1:

45 years old, T1 invasive luminal A tumor, BMI 25, 4 LN sampled, 0 malignant LN, non-smoker, no diabetes, No PMRT, TRAM flap, delayed reconstruction time, IMF incision:

\[
25 \times 0.0434122668 + 4 \times 0.0143117981 - 0.02661184 \approx 1.1
\]

Therefore, the risk of having infection/skin necrosis is \( \approx 1.3\% \)
To predict the risk of capsular contracture, add up the corresponding numbers:

\[
\text{BMI} \times (-0.030676412) + (\text{Number of LN sampled} \times 0.0282168102) + 0.922400314 \text{ if patient received RT with boost} + 0.7460267521 \text{ if patient received RT without boost} + 2.7282988488 \text{ if patient received proton} + 0.2619553903 \text{ if patient had LVI} - 0.530407536 \text{ if patient had neoadjuvant +/- adjuvant chemotherapy} - 0.206912399 \text{ if patient had adjuvant alone chemotherapy} + 0.3489143593 \text{ if patient had Vicryl mesh type} + 0.369232143 \text{ if patient had FlexHD mesh type} - 0.481312568 \text{ if patient had Surgimend mesh type} + 0.6700623557 \text{ if patient had complete/partial muscle coverage mesh type} + 0.3813270395 \text{ if patient had two stages reconstruction type} + 0.632948959 \text{ if patient had periareolar incisions} + 0.7821675449 \text{ if patient had horizontal or inferior radial incisions}
\]

The risk of capsular contracture as a function of Total Score

<table>
<thead>
<tr>
<th>TOTAL SCORE</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<td>0.19</td>
<td>0.39</td>
<td>0.63</td>
<td>0.82</td>
<td>0.93</td>
<td>0.97</td>
<td>0.99</td>
</tr>
</tbody>
</table>

Example 1:
A 45 year-old non-diabetic ex-smoker with a BMI of 28 presented with 1.3 cm invasive triple negative tumor with LVI, 4 positive out of 10 LNs removed. She received immediate expander/implant (TE/I) reconstruction using peri-areolar incision and complete muscle coverage followed by adjuvant chemotherapy and PMRT using photons+CWB

\[
28 \times (-0.030676412) + 0.2619553903 + 10 \times 0.0282168102 - 0.206912399 + 0.3813270395 + 0.6700623557 + 0.632948959 + 0.922400314 = 2.1
\]

Therefore, the risk of having capsular contracture is ≈ 20.4%
To predict the risk of absolute failure, add up the corresponding numbers:

0.9431421336 if patient is non-white race  
+ 0.8382803948 if patient is active smoker  
- 0.139588103 if patient is ex-smoker  
+ 1.74294743 if patient received RT with boost  
+ 0.3208746355 if patient received RT without boost  
+ 0.5466484307 if patient received proton  
+ 0.5888233047 if patient had Vicryl mesh type  
+ 1.3409065591 if patient had FlexHD mesh type  
+ 0.9667669631 if patient had Surgimend mesh type  
+ 0.4279086347 if patient had complete/partial muscle coverage mesh type  
+ 0.4060582059 if patient had two stages reconstruction type

The risk of absolute failure as a function of Total Score

<table>
<thead>
<tr>
<th>TOTAL SCORE</th>
<th>-1</th>
<th>0</th>
<th>1</th>
<th>2</th>
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<tr>
<td>Risk</td>
<td>0.004</td>
<td>0.01</td>
<td>0.03</td>
<td>0.07</td>
<td>0.17</td>
<td>0.36</td>
<td>0.60</td>
<td>0.81</td>
<td>0.92</td>
<td>0.97</td>
<td>0.99</td>
</tr>
</tbody>
</table>

Example 1:

A 45 year-old, white, non-diabetic ex-smoker with a BMI of 28 presented with 1.3 cm invasive triple negative tumor with LVI, 4 positive out of 10 LNs removed. She received single stage (DTI) through inframammary incision, Alloderm support and PMRT using photons only and no CWB, followed by adjuvant chemotherapy  
- 0.139588103 + 0.3208746355 = 0.3

Therefore, the risk of having absolute failure is ≈ 1.4%
To predict the risk of overall failure, add up the corresponding numbers:

Number of LN sampled x 0.0092093745
0.0501607482 if patient is peri-menopausal
- 0.271503643 if patient is post-menopausal
+ 0.726979974 if patient is active smoker
+ 0.0690824814 if patient is ex-smoker
+ 0.7332518298 if patient has diabetes
+ 0.6781993216 if patient received RT with boost
+ 0.0313540119 if patient received RT without boost
+ 1.2784616645 if patient received proton
+ 0.1242654537 if patient had LVI
- 0.157861541 if patient had neoadjuvant +/- adjuvant chemotherapy
+ 0.1976070149 if patient had adjuvant alone chemotherapy
- 0.291794301 if patient had Vicryl mesh type
+ 0.1867791205 if patient had FlexHD mesh type
+ 0.233060264 if patient had Surgimend mesh type
+ 0.2500311184 if patient had complete/partial muscle coverage mesh type
+ 0.4241440052 if patient had two stages reconstruction type
+ 0.7498142475 if patient had periareolar incisions
+ 0.1972285218 if patient had horizontal or inferior radial incisions

The risk of overall failure as a function of Total Score

<table>
<thead>
<tr>
<th>TOTAL SCORE</th>
<th>-4</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk</td>
<td>0.004</td>
<td>0.075</td>
<td>0.15</td>
<td>0.28</td>
<td>0.45</td>
<td>0.64</td>
<td>0.80</td>
<td>0.90</td>
<td>0.95</td>
<td>0.98</td>
<td>0.99</td>
</tr>
</tbody>
</table>

Example 1:
A 45 year-old, pre-menopausal, non-diabetic ex-smoker with a BMI of 28 presented with 1.3 cm invasive triple negative tumor with LVI, 4 positive out of 10 LNs removed. She received immediate expander/implant (TE/I) reconstruction using peri-areolar incision and complete muscle coverage followed by adjuvant chemotherapy and PMRT using photons+CWB

0.0690824814 + 0.1242654537 + 10 x 0.0092093745 + 0.4241440052 + 0.7498142475 + 0.2500311184 + 0.1976070149 + 0.6781993216 = 2.6
Therefore, the risk of having overall failure is ≈ 38%