Increased radiation dose measured at the skin was related to increased skin toxicity.

Toxicity Scoring:
- **Acute Toxicity:** CTCAE version 4.0 and RTOG cooperative group common toxicity criteria
- **Late Toxicity:** RTOG-EORTC criteria

### Results: Population Receiving IORT
- **58 Patients received IORT from 2009-2013**
- **14 month average follow-up**
- **One recurrent breast cancer**

### Results: Toxicity

<table>
<thead>
<tr>
<th>Grade of CTCAE/RTOG Toxicity and Frequency</th>
<th>Grade 2 toxicity</th>
<th>Grade 3 or 4 Percentage toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin Ulceration</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Breast Infection</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Radiation Dermatitis</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Wound complication</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Seroma</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Late Radiation Toxicity</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

**Overall Acute Skin Toxicity**: 15% (4%)

### Specific Aims
- To determine what population currently receives IORT at our institution
- To evaluate our acute and late toxicity rates

### Methods
- Retrospective chart review of IORT from 2009-2013 of patient, tumor and treatment factors
  - IORT was delivered by the Zeiss Intrabeam System following tumor excision.
  - Radiation dose to the skin was measured using the Nanodot dosimeter.
  - Toxicity Scoring: CTCAE version 4.0 and RTOG cooperative group common toxicity criteria
  - Late Toxicity: RTOG-EORTC criteria

### Conclusions
- Acute and Chronic Toxicity were not related to patient, tumor or procedure-associated factors including comorbidity, BMI, age, tumor depth, number of excisions or sphere size.
- Late radiation toxicity was related to acute toxicity.
- Increased radiation dose measured at the skin was related to increased skin toxicity $p=0.025$
- Patients currently undergoing IORT are:
  - Older with many medical comorbidities
  - Live throughout Oregon
  - Have small tumors with favorable features
  - Moderate complications are common and may be related to skin radiation exposure.
  - Severe toxicity is rare.
  - Many women who would otherwise undergo mastectomy are able to have breast preservation with IORT, but they should be made aware of the acute and late toxicities.

### Background

**Intraoperative Radiotherapy (IORT)** was shown to be safe and effective for the treatment of low stage cancers in the TARGIT-A trial.

**The use of IORT was further delineated by ASTRO (American Society for Radiation Oncology) Guidelines.**

Factors that may be considered for accelerated partial breast irradiation outside a clinical trial:
- Age ≥60
- 50-59 ≤60
- Tumor ≤2cm
- 2.1-3.0cm ≤2cm
- Depth ≤2cm
- 3.6-5.6 ≥3cm
- Skin Margins Negative ≥2mm Close (≤2mm) Positive
- ER Status Positive Negative
- Other Factors
  - BMI>30
  - Current Smokers
  - HTN
  - DM
  - Previous Radiation
  - Immunosuppression
  - Cardiac Disease (e.g. Atrial fibrillation)
  - Severe Pulmonary Disease
  - Immunocompromised

**Grade of CTCAE/RTOG Toxicity and Frequency**

- **Skin Ulceration**: 7
- **Breast Infection**: 6
- **Radiation Dermatitis**: 5
- **Wound complication**: 2
- **Seroma**: 10
- **Late Radiation Toxicity**: 3

**Overall Acute Skin Toxicity**: 15% (4%)