

# Brachytherapy for breast cancer

## PROMIS study provides new insights for APBI



CLINICAL REVIEW



### Outcomes of PROMIS registry data indicate that APBI with multi-catheter interstitial brachytherapy results in:

- Good efficacy and cosmesis<sup>1-4</sup>
- Similar survival and local control rates to published outcomes of mastectomy or Breast Conserving Therapy and Whole Breast Irradiation<sup>5-7</sup>
- Good clinical outcomes in previously deemed “unsuitable” patients<sup>4</sup>

APBI – Accelerated Partial Breast Irradiation

PROMIS – Pooled Registry of Multi-catheter Interstitial Sites

#### PROMIS Registry Overview

- APBI
- Multi-catheter interstitial brachytherapy
- 1,356 patients with early stages of breast cancer
- Five experienced sites in US
- Long term data: patients treated from 1992-2013
- One of the largest APBI registries to date
- Data presented at four key congresses in 2014<sup>1-4</sup>

## Breast conserving therapy (BCT) provides an efficacious treatment with equivalent survival outcomes to mastectomy<sup>5,8</sup>

- At least as effective as mastectomy.<sup>5,8</sup>
- Improved quality of life, social functioning, body image and physical functioning.<sup>9</sup>

## Accelerated Partial Breast Irradiation (APBI) as part of BCT is associated with good efficacy and patient convenience<sup>10-16</sup>

- Good efficacy of APBI documented in randomized, single and multi institution series.<sup>12</sup>
- APBI is convenient for patients, shortening the 5-7 week course of conventional whole breast irradiation to 4-5 days.<sup>12,17</sup>

## Interstitial brachytherapy is a convenient APBI technique associated with good efficacy and cosmesis<sup>10-12</sup>

- With > 10-year follow up, multiple series have documented good clinical outcomes with interstitial APBI.<sup>12</sup>
- Prospective studies indicate equivalent efficacy<sup>10,11</sup> and better cosmesis<sup>11</sup> at ≥ 10 years compared to standard whole breast irradiation (WBI).

### Clinical guidelines

Current guidelines, including ABS, ASTRO and GEC-ESTRO, describe patient groups which are suitable for APBI based on available clinical data at time of publication.<sup>12,17,20</sup>

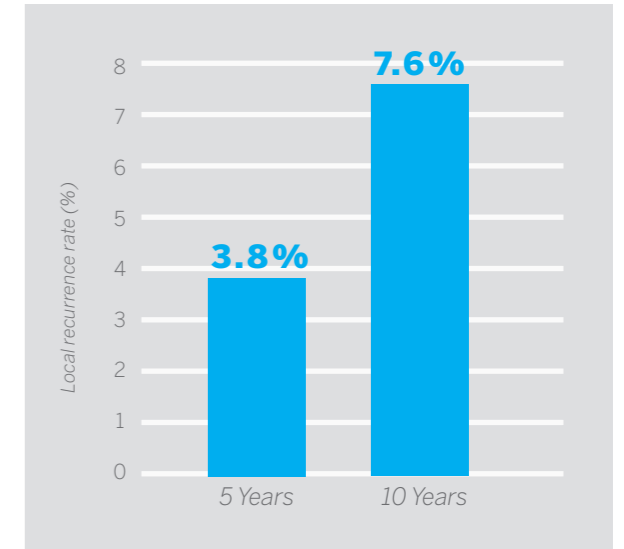
Patients < 50 years of age are currently described as unsuitable for APBI in ASTRO and ABS guidelines.<sup>12,20</sup>

| PATIENT/TUMOR FACTOR | CRITERIA          |
|----------------------|-------------------|
| Age                  | < 50 yrs          |
| Primary tumor size   | > 3cm             |
| T stage              | T3-4              |
| Margins              | Positive          |
| LVSI                 | Extensive         |
| Nodes                | Positive          |
| Multicentricity      | Present           |
| Multifocality        | > 3cm or clinical |
| Pure DCIS            | If > 3cm          |
| EIC                  | If > 3cm          |
| BRCA1/2 mutation     | Present           |

"Unsuitable patients" in ASTRO guidelines

## PROMIS study (n=1356) shows that APBI with interstitial multi-catheter brachytherapy results in good outcomes in a broad patient population

- Good overall efficacy<sup>1-4</sup>
- Good overall cosmesis<sup>1-4</sup>
  - Excellent/good in 84%
  - (362 patients at > 5 years)
- Clinical outcomes in line with mastectomy or BCT with WBI
  - PROMIS results in line with published outcomes of mastectomy or BCT with 6-7 weeks WBI<sup>1-4,6,7</sup>
- Broader patient group with good clinical outcomes including ASTRO "unsuitable" and DCIS patients<sup>2,4</sup>
  - Patients < 50 years of age and patients with positive nodes had no increased risk of local recurrence<sup>4</sup>



Good local control at 5 and 10 years

1,145 patients with > 1 year follow up

Diverse patient and tumor characteristics

| MEDIAN AGE (YRS)<br>59 (22-89) |       | MEDIAN TUMOR SIZE (MM)<br>10.5 (0.15-35) |           |
|--------------------------------|-------|------------------------------------------|-----------|
| Histology                      |       | Grade                                    |           |
| DCIS                           | 17.5% | Unk                                      | 3.8%      |
| IDC                            | 72.7% | Low                                      | 33.5%     |
| ILC                            | 3.6%  | Int                                      | 40.2%     |
| Other                          | 6.3%  | High                                     | 22.4%     |
| Nodal status                   |       | ER/PR/HER2 status                        |           |
| i+                             | 1.0%  | ER neg                                   | 11.5%     |
| N1                             | 6.5%  | PR neg                                   | 19.1%     |
|                                |       | Her2Unk/pos                              | 39.3/6.4% |

Broad patient population in terms of both patient and tumor characteristics

300 ASTRO "unsuitable" patients

| ASTRO UNSUITABLE TRAITS | PRESENT |
|-------------------------|---------|
| Age < 50                | 77%     |
| Primary > 3cm           | 1%      |
| T3-T4                   | None    |
| Positive margins        | 3%      |
| LVSI                    | 3%      |
| Positive nodes          | 25%     |

Many patients described as "unsuitable" for APBI in the ASTRO guidelines were included in the study

# CLINICAL OUTCOMES OF BREAST IRRADIATION AS PART OF BREAST CONSERVING THERAPY

## BREAST CONSERVING SURGERY

### ACCELERATED PARTIAL BREAST IRRADIATION

#### Intracavitary balloon

- Non randomized data up to 7 years follow up<sup>12</sup>
- Mammosite registry<sup>13</sup> > 1400 pts
- Good efficacy: LR 3.8% at 5 years
- Good/excellent cosmesis in 90.6% at 7 years

#### Intracavitary strut

- None randomized data up to 5 years follow up<sup>15,16</sup>
- SAVI registry > 1000 patients<sup>15,16</sup>
- Good efficacy: LR 3% at 5 years
- Good/excellent cosmesis in 93% at 2 years

#### EBRT

- Single series with 5 year follow up (44 pts)
- Good efficacy: 3.7% 5 years
  - Good/excellent cosmesis in 86% at 5 years.<sup>18</sup>
- Randomized RAPID study interim results > 2000 pts: APBI vs WBI<sup>19</sup>
  - Increased rate of adverse cosmesis and grade 1/2 toxicity in APBI group

#### Multi-catheter interstitial

- Multiple series with > 10 years follow up with good clinical outcomes<sup>12</sup>
- Randomized trial vs WBI showed better cosmesis with interstitial brachy<sup>10</sup>
- LR 5.9% vs 5.1% (p=0.77) at 10 years
  - Good/excellent cosmesis in 85% (interstitial) vs 72.5% (WBI)

### WHOLE BREAST IRRADIATION

Randomized prospective trials:

#### WBI vs interstitial<sup>10</sup>

- LR at 10 years 5.1% vs 5.9% (p=0.77)
- Good/excellent cosmesis in 72.5% (WBI) vs 85% (interstitial)

#### WBI vs EBRT APBI<sup>19</sup>

- RAPID study Interim analysis
- Increased rate of adverse cosmesis at 3 years in EBRT APBI group
  - 17% vs 29%

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