Comparing Treatment Results Of PROSTATE CANCER

Prostate Cancer Results Study Group
Updated January 2017

Prostate Cancer Treatment Research Foundation
Problem: Patients, physicians and providers need simple, unbiased data by which to compare the effectiveness of modern prostate cancer treatment methods. The most effective treatments are those in which the patient remains Prostate Cancer Free® for their lifetime.
The Study Group is an assembly of international experts from key treating disciplines:

- Surgery (RP & Robotic)
- External Beam Radiation Therapy (EBRT)
- Brachytherapy (Seeds)
- High Frequency Ultrasound (HIFU)
- Proton Therapy (Protons)
- Cryotherapy (Cryo)

The purpose of this work is to review all of the current literature on prostate cancer treatment and provide results to patients and their physicians.
Prostate Cancer Results Study Group

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About This Review Study

- +48,700 prostate articles were published between 2000 and June 2016.
- 1,502 of those articles featured treatment results.
- 223 articles have met PCRSG criteria to be included in this review study.
- Some treatment methods are under-represented due to failure to meet criteria.
“Will I be cured?” or “Will my treatment make me cancer free?” are valid patient questions.

The indicator of being **Prostate Cancer Free®** is a low PSA level which does not rise.

Five to ten years after treatment, a low PSA level indicates cancer is controlled and there is a high likelihood the cancer will not return.

Results greater than five years are necessary to be able to compare treatment results.

Success is defined as PSA at a low level and not rising during the lifetime of a patient “**Prostate Cancer Free®.**”
After prostate surgery, PSA numbers usually fall rapidly to very low numbers and stay low.

After radiation, PSA numbers usually come down slower, and may increase briefly, then subsequently fall (this is called a “PSA Bump.”)

These different PSA expectations result in dissimilar ways to review a man’s PSA history to judge treatment success.

A consistent rise in PSA after five years is generally considered a treatment failure.
Brachy = Seed Implantation (Brachytherapy, either permanent or temporary seeds)
EBRT = External Beam Radiation Therapy (includes IMRT = Intensity Modulated Radiation Therapy)
RP = Standard Open Radical Prostatectomy
Robot RP = Robotic Radical Prostatectomy
HIFU = High Intensity Focused Ultrasound
Cryo = Cryotherapy
Protons = form of External Radiation using Protons
ADT = Hormone Therapy
The expert panel agreed unanimously on the criteria an article has to meet to be accepted for comparison purposes.

Every Prostate Cancer article written between 2000 and June 2016 was reviewed. First to determine if it was a treatment article, and secondly if it met the expert panel's inclusion criteria.

The results of the accepted treatment articles were plotted together according to each risk group’s “Prostate Cancer Free®” status (in the professional literature this is known as PSA Progression Free status, meaning no evidence of a rising PSA.)
Article Review Process

- All article evaluations and graph plottings are reviewed by the Article Review Committee and then submitted to the Expert Panel for confirmation prior to all study updates.

- All data recipients, including patients and physicians, are invited to critique the data and submit articles for the PCRSG review process.
1. Articles must be published in a Major Medical Journal.

2. Patients should be separated into Low-, Intermediate-, and High-Risk Groups.

3. Success must be determined by PSA analysis.

4. All major treatment types considered: Seeds (Brachy), Surgery (Standard or Robotic), EBRT (including IMRT), HIFU (High Intensity Frequency Ultrasound), CRYO (Cryotherapy), Protons, HDR (High dose Rate Brachytherapy)

* Expert panel consensus
5. Low-Risk articles a minimum of 100 patients.

6. Intermediate-Risk articles a minimum of 100 patients.

7. High-Risk articles, because of fewer patients, a minimum of 50 patients.

8. Patients need to be followed for a median of 5 years.

For additional criteria information contact: l.grimm@pctrf.org
### % Articles Meeting Criteria by Treatment

<table>
<thead>
<tr>
<th></th>
<th>RP</th>
<th>EBRT/IMRT</th>
<th>Cryo</th>
<th>Brachy/HDR</th>
<th>Robot RP</th>
<th>Proton</th>
<th>HIFU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>9%</strong></td>
<td>16%</td>
<td>6%</td>
<td>24.8%</td>
<td>5.1%</td>
<td>20%</td>
<td>12.7%</td>
<td></td>
</tr>
<tr>
<td><strong>37/410</strong></td>
<td>68/427</td>
<td>3/50</td>
<td>100/403</td>
<td>5/98</td>
<td>5/20</td>
<td>6/47</td>
<td></td>
</tr>
</tbody>
</table>

Total of 1,502* Treatment Articles. Some articles addressed several treatments and were counted as separate articles for each treatment. *Some articles evaluated other/minor treatments that are not listed here and are therefore not included in these calculations.

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Each Treatment is given a symbol. For example Seed implant alone (Brachytherapy) is given a blue dot.

Each Symbol is a different article for that treatment. At the website you can put a cursor over the symbol and actually retrieve that article.

Treatment Success= Percent of men whose PSA numbers indicate a Prostate Cancer Free® Status (PSA progression free) at a specific point in time.

The bottom line indicates the number years the study is out.

An example, a blue dot positioned at 12 years along the 97% line indicates that, 97% of the patients, treated with seeds alone in low-risk patients at 12 years were free of disease progression and were Prostate Cancer Free®.
How to Interpret the Graphs

- The colored ellipses outline the results of multiple articles in the same treatment. These were created by our statisticians using standard statistical methods.
- These ellipses demonstrate 2 things:
  1. dividing the ellipses in half will give you the average result of the treatment.
  2. The direction of the ellipse will give you an idea of the long term success. A downward direction of the ellipse indicates that some patients are failing over time.
  3. Ideally, if a treatment reaches a point where no or few patients fail, the ellipse pattern will look like this.
- There are interactive versions of the graphs on the website: www.pctrf.org/comparing-treatments/ You can choose which treatments and ellipses to view by checking and un-checking the boxes in the key on the right.
Ellipses are not available for all treatments. They can only be done if there are 4 or more accepted studies within that treatment, so some treatments may not appear on the slides as ellipses only data points.

In general: Brachytherapy symbols are blue
EBRT/IMRT symbols are green
Protons symbols are yellow
Surgery symbols are red
Cryotherapy symbols are purple
HIFU symbols are gray
Treatment Symbols Ledger— for all risk groups graphs

**Brachytherapy**
- Brachytherapy alone
- Brachytherapy & EBRT
- Brachytherapy, EBRT, & ADT
- HDR (Brachytherapy)
- HDR & ADT (Brachytherapy)

**EBRT/IMRT**
- EBRT alone
- EBRT & ADT
- Hypo EBRT

**Protons**
- Protons

**Surgery**
- RP Surgery
- Robotic Surgery
- RP Surgery & EBRT

**Cryotherapy**
- Cryotherapy

**HIFU**
- HIFU

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How to Interpret the Results

- The Risk groups are defined by a combination of factors. These factors are provided by the diagnosing physician and include the stage of the cancer, the Gleason Score, and PSA level. See slides 20, 23, and 26 for specific definitions for each risk-group.
- First establish your clinical risk group* by looking at the definitions (you can also ask your physician for help in determining you risk group.) Refer only to those slides for your risk group.
- Make your own judgment and then ask a doctor in each discipline (Seeds, External Radiation, Surgery, etc.) to tell you where his/her own peer reviewed published Treatment Success % would fit on this plot.

*Next Slide
The low-risk group is defined by a combination of factors. These factors are provided by the diagnosing physician and include the stage of the cancer, the Gleason Score, and PSA level. The low-risk group is defined by:

- **Clinical Stage:** T1 or T2a,b
- **Gleason Score** \( \leq 6 \)
- **PSA** \( \leq 10 \text{ ng/ml} \)
Low Risk Results

Protons

LDR Brachy

EBRT/IMRT

Surgery

Worse < Treatment Success --> Better % PSA Progression Free

Shorter <-- Years from treatment --> Longer

Legend:
- RP Surgery
- Robot Surgery
- Surgery σ
- Seeds and EBRT
- Seeds Alone
- Seeds Alone σ
- EBRT Alone
- EBRT Alone σ
- Protons
- Protons σ
- HDR
- HIFU
Low Risk Results

Worse (% PSA Progression Free) --- Better

Shorter --- Years from treatment --- Longer

- Protons
- LDR Brachy
- EBRT/IMRT
- Surgery

Legend:
- RP Surgery
- Robot Surgery
- Surgery σ
- Seeds and EBRT
- Seeds and EBRT σ
- Seeds Alone
- Seeds Alone σ
- EBRT Alone
- EBRT Alone σ
- Protons
- Protons σ
- HDR
- HIFU
The intermediate-risk group is defined by a combination of factors. These factors are provided by the diagnosing physician and include the stage of the cancer, the Gleason Score, and PSA level. The intermediate-risk group has 2 definitions that can be used:

- **Zelefsky definition**
  - Only 1 factor
    - Clinical Stage T2c
    - Gleason Score > 7
    - PSA > 10 ng/ml

- **D’Amico definition**
  - PSA 10-20, Gleason Score 7, or Clinical Stage T2b
The high-risk group is defined by a combination of factors. These factors are provided by the diagnosing physician and include the stage of the cancer, the Gleason Score, and PSA level. The high-risk group has 2 definitions that can be used:

- **Zelefsky definition**
  - 2 or more factors
    - Gleason Score > 7
    - PSA 10-20
    - Clinical Stage T1c- T2b

- **D'Amico definition**
  - Gleason Score 8-10, PSA >20, Clinical Stage >T2c
Observations

- For most low-risk patients, most therapies will be successful.
- Treatments at the top of the results comparison graphs for the long periods of years, indicate that patients treated with these methods did not experience an increase in PSA after treatment. These patients are more likely to remain *Prostate Cancer Free®*. Patients are encouraged to look at graphs and determine for themselves.
- Serious side-effect rates must be considered for any treatment.
Risk Group Definitions

**Low Risk**
- Stage: T1 or T2a,b
- Gleason Score $< 6$
- PSA $< 10$ ng/ml

**Intermediate Risk**
- Stage T1 or T1-2
- Gleason Score 7 or Gleason Score 6
- PSA < 10
- PSA 10-20

**High Risk**
- Stage T2c or T3
- Gleason Score $\geq 8$
- PSA $> 20$ ng/mL
For Questions or More Information

- Prostate Cancer Treatment Research Foundation website: [www.pctrf.org](http://www.pctrf.org)

- Contact the Prostate Cancer Treatment Research Foundation: [information@pctrf.org](mailto:information@pctrf.org)

- Additional information for Study Group members: [www.pctrf.org/study-group-members/](http://www.pctrf.org/study-group-members/)