### Background

Worldwide, prostate cancer is the second leading cause of death due to cancer in men. Transrectal ultrasound-guided brachytherapy is now considered to be one of the definitive treatment options for early-stage prostate cancer, with nearly 25 per cent of new prostate cancer cases being treated in this way. Although now widely used, the procedure is still susceptible to inaccuracies due to pubic arch interference, dosimetry optimization, precision of needle placement, anatomical changes during the procedure (e.g., swelling) and non-optimal post-plan.

### Technology

This novel 3-D ultrasound-guided transperineal prostate biopsy, brachytherapy and focal therapy platform consists of:

- 3-D ultrasound acquisition, reconstruction and display;
- Rapid image segmentation of the prostate, needle and seeds;
- Available non-rigid 3-D MRI image co-registration with 3-D ultrasound imaging;
- Robot controlled guidance of needle along predetermined oblique trajectories; and
- Intra-operative dynamic dose planning. Pre-planning, dosimetry, registration of dose plan to 3-D image volume, and real-time re-planning, is applicable to high dose rate (HDR) and low dose rate (LDR) brachytherapy.

### Advantages

This technology provides:

- Precise needle placement;
- Adaptability for transperineal biopsy, brachytherapy and various focal treatments;
- Visualization of anatomical changes during the procedure;
- Circumvention of the pubic arch, allowing full access to enlarged prostates without androgen deprivation therapy; and
- Optimal dynamic dose planning.
<table>
<thead>
<tr>
<th>Intellectual Property Position</th>
<th>Protected by patents issued and pending worldwide.</th>
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<tbody>
<tr>
<td>Key Personnel</td>
<td>Dr. Aaron Fenster, of the Robarts Research Institute at The University of Western Ontario, is the principle investigator.</td>
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<tr>
<td>Business Opportunity</td>
<td>Various aspects of this technology have been licensed exclusively and non-exclusively.</td>
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