Bladder Cancer: Disease and Pipeline Analysis
Report Overview

This report offers an in-depth market and pipeline analysis of the bladder cancer market. This unique therapeutic assessment provides an overview of the current and future bladder cancer clinical development market, the activities of the key market players, and an outline of trial and commercial regulatory environments.

How you can use this report:

• Identify and enhance commercial and development opportunities with an in-depth analysis of the global bladder cancer market including global and country-specific incidence rates for bladder cancer

• Plan how products currently in development could impact this market and understand competitor involvement

• Plan your clinical trial strategy better by understanding the clinical trial environment across regions

Report Structure:

1. Disease Overview
2. Bladder Cancer Epidemiology
3. Bladder Cancer Diagnosis and Staging
4. Bladder Tumour Classification
5. Treatment of Bladder Cancer
6. Bladder Cancer Prognosis
7. Environmental Analysis
8. Drug Development in Bladder Cancer

Companies Included:

• Aadi LLC
• Altor Bioscience
• Amgen
• Bayer
• BioCancell Ltd
• Bioniche Therapeutics
• Cold Genesys Inc
• Dendreon
• Eisai
• Eli Lilly
• FKD Therapies Oy
• GSK
• Heat Biologics
• Macrogenics
• Novartis
• Oncogenix Technologies
• Spectrum Pharma
• Tracon Pharma
• Viventia Biotech

Countries Analyzed:

• Brazil
• China
• France
• Germany
• India
• Italy
• Japan
• Russia
• South Korea
• Spain
• United Kingdom
• United States
Table of Contents

Copyright and Usage Guidelines
Table of Acronyms
Chapter 1 - Disease Overview
  Figure 1. Male and Female Urinary System
  Transitional Cell Carcinoma (TCC)
  Figure 2. Tumours within the Bladder as Viewed by Cystoscopy
  Carcinoma in situ
  Squamous Cell Carcinoma (SCC)
  Other tumour types
  Classification
Bladder Cancer Risk Factors
  Cigarette Smoking
  Occupational Exposure to Carcinogens
  Medical Conditions and Procedures
  Bilharzia
  Heredity
  Dietary factors
  Gender
Chapter 2 - Bladder Cancer Epidemiology
  Bladder Cancer Incidence
    Table 1. Incidence of Bladder Cancer in the Major Markets
    Figure 4. Countries with the Highest Rate of Bladder Cancer (2012), Both Sexes
    Figure 5. Countries with the Highest Number of Bladder Cancer Cases (2012), Both Sexes
    Table 2. Age at Diagnosis of Bladder Cancer
    Table 3. Incidence Rate of Bladder Cancer by Ethnicity (US)
  Bladder Cancer Mortality
    Table 4. Bladder Cancer Mortality in the Major Markets
    Figure 6. Countries with the Highest Age Standardised Mortality Rate of Bladder Cancer (2012), Both Sexes
    Figure 7. Countries with the Highest Numbers of Deaths from Bladder Cancer (2012), Both Sexes
    Table 5. Age at Death from Bladder Cancer
Chapter 3 - Bladder Cancer Diagnosis and Staging
  Initial Patient Assessment
  Symptoms
  Physical examination
  Urinalysis
  Urine Cytology
  Urinary molecular marker tests
    Table 6. Approved Urine Tests
  Cystoscopy
  Biopsy
  Trans Urethral Resection (TUR)
  Radiographic Imaging Techniques
Chapter 4 – Bladder Tumour Classification
  Table 7. Classification of Primary Tumour, Lymph Nodes and Metastases in Bladder Cancer
  Figure 8. The Extent of Bladder Tumour Penetration by Stage
  Table 8. WHO Grading System
Chapter 5 – Treatment of Bladder Cancer
  Treatment by Disease Stage
    Low Grade Non Muscle Invasive Bladder Cancer (Ta)
    High Grade Non Muscle Invasive Bladder Cancer (Tis, T1)
  Treatment Failure of Non-Muscle Invasive Bladder Cancer
  Muscle invasive bladder cancer (T2-T4)
  Advanced Bladder Cancer
  Palliative Care
  Treatment of Bladder Cancer by Therapy Type
    Trans Urethral Resection (TUR) of the Bladder Tumour
    Radical Cystectomy
    Immunotherapy
    Chemotherapy
Chapter 6. Bladder Cancer Prognosis
  Table 10. Bladder Cancer Stage at Diagnosis and Relative Survival
  Table 11. EORTC-GUCG weighting used to calculate disease recurrence and progression scores
  Table 12. Probability of Recurrence and Progression based on EORTC-GUCG score
  Table 13. Probability of non-muscle invasive bladder cancer progression and recurrence - NCCN
Chapter 7. Environmental Analysis
  Bladder Cancer Unmet Needs
    Diagnosis
    Treatment
    Follow up
  Major Market Analysis
Table of Contents

Trial and Recruitment Environment
Regulatory Environment
Competitive Product Landscape
Pricing and Reimbursement Environment
Emerging Market Analysis
Table 15. Bladder Cancer - Emerging Markets Patient Population and Product Environment
Trial and Recruitment Environment
Regulatory Environment
Competitive Product Landscape
Pricing and Reimbursement Environment
Patient Recruitment Environment
Figure 9. Geographic Distribution of Active Clinical Trials
Figure 10. Distribution of Active Bladder Cancer Trials by Phase
Table 16. Number of Patients in Each Phase of Clinical Trial

Chapter 8. Drug Development in Bladder Cancer
Angiogenesis Inhibition
Growth Factor Inhibitors
Figure 11. Major intracellular pathways targeted for the treatment of bladder cancer
Immunotherapeutics
Gene Therapy
New Therapies in Active Development for the Treatment of Bladder Cancer
Table 17. Bladder Cancer Development Pipeline
Urocidin, Bioniche Life Sciences
EOQuin/Apaziquone, Spectrum Pharmaceuticals
CG0070, Cold Genesys
Vicinium (VB4-845), Viventia Biotech
OGX-427, Oncogenex Pharmaceuticals
BC-819, BioCancell Therapeutics
DN24-02, Dendreon
Dovitinib, Novartis Pharmaceuticals
Icrucumab, Eli Lilly
Instiladrin, FKD Therapies
MAGE-A3, GlaxoSmithKline (GSK)
Ramucirumab, Eli Lilly
Trebananib (AMG386), Amgen

Citations
Bladder Cancer Diagnosis and Treatment Guidelines
About Industry Standard Research
Table 10. Bladder Cancer Stage at Diagnosis and Relative Survival

<table>
<thead>
<tr>
<th>Stage at Diagnosis</th>
<th>% Cases Diagnosed</th>
<th>5 Year Relative Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>In situ</td>
<td>51</td>
<td>96.4</td>
</tr>
<tr>
<td>(cancer only in the originating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>layer of cells)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Localized</td>
<td>35</td>
<td>70.2</td>
</tr>
<tr>
<td>(tumour confined to the primary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>site)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional</td>
<td>7</td>
<td>33</td>
</tr>
<tr>
<td>(cancer spread to regional lymph</td>
<td></td>
<td></td>
</tr>
<tr>
<td>nodes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distant</td>
<td>4</td>
<td>5.4</td>
</tr>
<tr>
<td>(cancer has metastasized)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>3</td>
<td>49.6</td>
</tr>
</tbody>
</table>

Source: SEER

Significant prognostic factors for bladder cancer include the pathologic grade of the tumour, the depth of the tumour invasion into the bladder wall, and the presence of CIS. The time interval until tumour recurrence is another significant prognostic factor. Tumour recurrence within two years of treatment is associated with increased risk of disease progression and is indicative of an aggressive tumour. For patients diagnosed with muscle invasive bladder cancer, the involvement of the lymph nodes is an important prognostic feature. A substantial portion of patients who are diagnosed with muscle invasive bladder cancer have undetected metastases at the time of treatment of the primary tumour.

While the survival rates for bladder cancer are high, the disease is associated with a high rate of recurrence. Up to 80% of patients have at least one recurrence of the disease following treatment. Risk factors for recurrence and progression include larger tumour size, multifocality, a larger number of tumours, high tumour grade, advanced stage, and female sex.

Scoring systems and risk tables are used to predict the risks of progression and recurrence for individual patients. An example is the system developed by the European Organization for Research and Treatment of Cancer (EORTC) Genito-Urinary Cancer Group (GUCG). This system was based on the EORTC database which provided individual patient data from randomised EORTC-GUCG trials. Table 11 shows the criteria used and weighting applied to each criterion.
Major Market Analysis

Table 14 shows the number of new cases of bladder cancer estimated to be diagnosed in the seven major markets of the US, France, Germany, Italy, Spain, UK, and Japan in 2014 and 2020. The incidence rate is likely to remain stable in the future as the impact of anti-smoking campaigns and resultant decrease in smoking rates continues to take effect. The increasingly ageing population will contribute to an overall increase in number of new cases. The relatively long life expectancy and high rate of recurrence of bladder cancer means that the healthcare burden of these patients is high.


<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>France</th>
<th>Germany</th>
<th>Italy</th>
<th>Spain</th>
<th>UK</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of new bladder</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cancer cases 2014 (E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of new bladder</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cancer cases 2020 (E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trial and Recruitment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulatory Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competitive Product</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landscape</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reimbursement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data available in full report

Source: Globocan 2012 and analyst calculations and assessment (E)=estimate

- Positive for the Pharmaceutical Industry
- Neutral for the Pharmaceutical Industry
- Negative for the Pharmaceutical Industry

In addition to the potential new patient population, four aspects of drug development and approval have been evaluated for each country: (1) clinical trial and recruitment environment; (2) regulatory environment; (3) competitive product landscape, and (4) pricing and reimbursement environment.
New Therapies in Active Development for the Treatment of Bladder Cancer

The following therapies are under active development for the treatment of bladder cancer by the biotech and pharmaceutical companies which own or have rights to them. The chart does not include therapies approved for use in other indications with demonstrated mechanisms of action that are being investigated in bladder cancer by academic groups.

Table 17. Bladder Cancer Development Pipeline

<table>
<thead>
<tr>
<th>Drug</th>
<th>Phase</th>
<th>Developing Company</th>
<th>Mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQUINOXIN</td>
<td>III</td>
<td>Spectrum Pharma</td>
<td>bioreductive</td>
</tr>
<tr>
<td>UROCIDIN</td>
<td>III</td>
<td>Bioniche Therapeutics</td>
<td>Immunotherapeutic</td>
</tr>
<tr>
<td>CG0070</td>
<td>II/III</td>
<td>Cold Genesys Inc</td>
<td>Gene Therapy</td>
</tr>
<tr>
<td>VB4-845</td>
<td>II</td>
<td>Viventia Biotech</td>
<td>mAb-immunotoxin</td>
</tr>
<tr>
<td>Apatorsen</td>
<td>II</td>
<td>Oncogenix</td>
<td>Hsp27 inhibition</td>
</tr>
<tr>
<td>BC-819</td>
<td>II</td>
<td>BioCancell Ltd</td>
<td>Cancer vaccine (HER2+ve)</td>
</tr>
<tr>
<td>DN24-02</td>
<td>II</td>
<td>Dendreon</td>
<td>FGFR TKI</td>
</tr>
<tr>
<td>Dovitinib</td>
<td>II</td>
<td>Novartis</td>
<td>VEGF mAb</td>
</tr>
<tr>
<td>Instiladrin</td>
<td>II</td>
<td>FKD Therapies Oy</td>
<td>VEGFR2 Anti-angiogenic</td>
</tr>
<tr>
<td>MAGE-A3</td>
<td>II</td>
<td>GSK</td>
<td>Immunotherapeutic</td>
</tr>
<tr>
<td>Ramucirumab</td>
<td>II</td>
<td>Lilly</td>
<td>VEGFR2</td>
</tr>
<tr>
<td>Trebananib</td>
<td>II</td>
<td>Amgen</td>
<td>Anti-angiogenic</td>
</tr>
<tr>
<td>ABI-009</td>
<td>I/II</td>
<td>Aadi LLC</td>
<td>mTOR inhibitor</td>
</tr>
<tr>
<td>ALT-801</td>
<td>I/II</td>
<td>Altor Bioscience</td>
<td>Recombinant fusion protein</td>
</tr>
<tr>
<td>Eribulin</td>
<td>I/II</td>
<td>Eisai</td>
<td>Microtubule inhibitor</td>
</tr>
<tr>
<td>HS-410</td>
<td>I/II</td>
<td>Heat Biologics</td>
<td>Heat shock protein inhibitor</td>
</tr>
<tr>
<td>TRC105</td>
<td>I/II</td>
<td>Tracon Pharma</td>
<td>CD105 mAb</td>
</tr>
<tr>
<td>BAY1163877</td>
<td>I</td>
<td>Bayer</td>
<td>Pan FGFR inhibitor</td>
</tr>
<tr>
<td>Margetuximab</td>
<td>I</td>
<td>Macrogenics</td>
<td>HER2 inhibitor</td>
</tr>
</tbody>
</table>

Data available in full report
Ordering Information

To obtain full access to this report, please select one of the following licenses:

<table>
<thead>
<tr>
<th>License</th>
<th>Details</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Single-user License</strong></td>
<td>A single-user license allows access to a single individual user.</td>
<td>$2,960 USD</td>
</tr>
<tr>
<td><strong>Site-wide License</strong></td>
<td>A site-wide license allows access to organization employees within a particular geographic site/location (i.e. NYC or London office).</td>
<td>$4,400 USD</td>
</tr>
<tr>
<td><strong>Enterprise-wide License</strong></td>
<td>An enterprise-wide license allows access to ALL employees in an organization – this is the recommended license if a report has widespread relevance throughout an organization.</td>
<td>$5,920 USD</td>
</tr>
</tbody>
</table>

To purchase the report with a credit card or invoice, simply click on the desired license above to be taken to the report page. If you’d like to inquire about a different payment method or have questions, contact us at Sales@ISRreports.com or +1.919.301.0106.

To schedule a call to discuss this report with one of our analysts, please e-mail us at info@ISRreports.com.

About Industry Standard Research

Industry Standard Research (ISR) is the premier, full service market research provider to the pharma and pharma services industries. With over a decade of experience in the industry, ISR delivers an unmatched level of domain expertise.

For more information about our off-the-shelf intelligence and custom research offerings, please visit our Web site at www.ISRreports.com, email info@ISRreports.com, or follow us on twitter @ISRreports.
The ISR Difference

Custom-quality syndicated market research

ISR's Reports vs. The Common Syndicated Report

How confident are you?

Research Methods

- Mostly primary research; always appropriate for the topic
- ISR's proprietary data collection tools and channels support fast, high quality data collection
- Sophisticated screening ensures genuine decision-makers
- Robust sample sizes that instill confidence
- Decades of experience means more insights that are immediately usable

vs.

- One size fits all; usually publically available data
- Struggle to recruit the right targets and enough of them
- Undisclosed methodologies and respondent demographics
- Often insufficient industry representation that leaves you defending results
- Junior analysts capable of reporting numbers