Situation und Rahmenbedingungen für die Präzisionsmedizin

Friedrich von Bohlen | Berlin | 28. Februar 2018
Precision Medicine

Key Elements

**Biology**
Genome.
In future all other \-'omes'.

**IT**
Databases.
Integration.
Curation.
Interpretation.
UIs.
Networks.

**Medicine**
EMR Data.
Real World Data (RWD).
Randomized Clinical Trials (RCT).

Source:
The Challenge: Integration, Connectivity, Interpretation

<table>
<thead>
<tr>
<th>TODAY</th>
<th>TOMORROW</th>
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<tbody>
<tr>
<td><strong>Current disease focus:</strong></td>
<td><strong>Future disease focus:</strong></td>
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<tr>
<td>Oncology and rare diseases</td>
<td>Ca. 30,000 different diseases</td>
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<td><strong>Current “-omes”:</strong></td>
<td><strong>Future “-omes”:</strong></td>
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<td>Genome: 22,000 genes, but today mostly panels (50-750 genes), i.e. only 1% of the Genome</td>
<td>Genome: 22,000 genes</td>
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<td>Transcriptome: 120,000 transcripts</td>
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<td>Proteome: 500,000 proteins</td>
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<td>Metabolome: &gt;1,000,000 metabolites</td>
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<td><strong>Current drugs:</strong></td>
<td><strong>Future drugs:</strong></td>
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<td>40,000</td>
<td>&gt; 40,000, including individual drugs</td>
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Current and future number of patients in longitudinal translational databases

<200,000 | Everybody
What defines Precision Medicine?

- Clinical and molecular patient data as a basis for diagnosis, therapy decision support and tracking of treatment success.

- IT in the center of integration, treatment-decision support, interpretation, networks.

- Structured and ever-growing literature-based world knowledge, EMR data, RWD and RCT as key reference system for interpretation and decision making.

- Smartphones and social networks as tools and enablers of a more and more educated and responsible patient/consumer/customer.
Reimbursement situation for NGS clinical diagnostics in Europe

Along these initial conditions, reimbursement schemes – and resulting price levels – are very different in Europe.

Reimbursement also differs
- between inpatient (hospital) or outpatient (ambulatory) setting;
- between budget-based systems (e.g. UK, Spain, Sweden) and fee-schedule-based systems (e.g. Germany, France, Italy, Switzerland, Austria).
HTA situation for NGS clinical diagnostics in Europe

• **HTA (Health Technology Assessment) is essential for pricing and reimbursement.**

• **Country-to-country variations** in Europe are large. Some countries show additional intra-national HTA variations.

• The different HTA criteria lead, nationally and locally, to **different coverage decisions**, and to **different pricing**.
# HTA situation for NGS clinical diagnostics in Europe

Existing parameters of HTA in selected European countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Clinical effectiveness</th>
<th>QOL</th>
<th>Cost effectiveness</th>
<th>Cost/QALY</th>
<th>Budget impact</th>
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Source: EPEMED
HTA situation for NGS clinical diagnostics in the USA, China and Japan

In regulation not as far as Europe:
• No stringent FDA guideline to approve such type of IVDs as of today.

Fast follower, looking for experiences to build a Chinese solution:
• Reimbursement will come later, at the moment only private payment, but: very interested in CDx for common cancer (breast, lung, ...). preferably approved as IVD and CDx in one step.

Fast follower, willing to adapt best practice:
• Health care system similar to Germany. First NGS clinical diagnostics IVD to be approved in 2019 with PMDA. Willing to approve also large panels or WES.
• “Automated” reimbursement after approval with MHLW.
HTA/clinical examination and pricing in Selective Payer Agreements

Chosen approach: selective contracts according to § 140a SGB V

Selective contracts for selected clinical questions in order to:

• **Avoid** inefficient medications (non-responders).

• **Avoid** and/or reduce toxic side effects.

• **Improve** therapeutic results, quality of life and avoid unnecessary costs (days in hospital, costs of treatment of toxic side effects, costs of inefficient therapies).

-> Hence a routine application within the guidelines/therapy recommendation(s) is thinkable as now a distinction is possible between equally ranking therapy options.
HTA/clinical examination and pricing in Selective Payer Agreements

Basic principles for selective contracts

- Applied bioinformatic products require a **strict quality assurance**. Usually they must be registered as a medical device/in-vitro-diagnostics.

- Sequencing laboratories **must be ISO 17020/17025/15189 accredited**.

- Participating hospitals are **exclusively DGK-certified Cancer Centers**.

- The evaluation concept suffices **international standards** with respect to a benefit estimation.
Future developments: More unified, more stringent...

In January, the EU Commission published a proposal on EU-wide harmonized HTA for Medicines and Medical Devices

Goals:

• **Joint clinical assessments** focusing on the most innovative and potentially impactful health technologies for maximum EU-added value;

• **Joint scientific consultations** whereby developers of a health technology can seek the advice of HTA authorities on what type of data and evidence is likely to be required in the submission for HTA;

• **Identification of emerging health technologies** to help ensure that the most promising health technologies for patients and health systems are identified early and included in the joint work; and

• **Voluntary cooperation** in areas outside the scope of mandatory cooperation, for example on health technologies other than medicines and medical devices (e.g. surgical procedures), or on economic aspects of health technologies.
Where does Precision Medicine lead to?

- Precise individual molecularly-based diagnosis, **predictable efficacious and safe** therapies and therapy options, precise follow-up of therapy success.

- **Better safety. Higher Efficacy. Lower case-specific cost.**

- Pharma can develop novel drugs and therapies faster, cheaper and more successful → **lower cost of discovery and development, faster time to cure, longer patent protection, better clinical trial and market success.**

- **VBR (Value-Base Reimbursement).**

→ **OUTCOMES-BASED MEDICINE**
Precision Medicine Summary

From an observation- and IT-supported fee-for-service medicine to a clinical-molecular-driven and IT-centric outcomes-based medicine.
Summary (maybe)

"My physician prescribed a personalized therapy. Here’s my DNA sequence"