Terumo R&D System

Collaborative effort to achieve a successful corporate growth strategy

CTO

Company R&D
- Innovation for companies pipeline
- Short- to mid-term

Evolution of core technologies

Corporate R&D
- Innovation for future healthcare
- Long-term
Contribute to Future of Healthcare with Significant Social Impact

- Diseases that increase with age
- Diseases that create large social burdens
- Diseases that lead to business opportunities
Chronic Heart Failure (CHF)
CHF Is Not Prevented by Treating Just One Disease

- Hypertension
- Myocardial infarction
- Arrhythmia
- Valve disease
- Cardiac toxicity of anticancer drugs

CHF onset probability increases with age

Chronic heart failure (CHF)

Decline in blood flow

Disturbance in water balance

Nephropathy
Repeated Emergency Hospitalization in CHF

<table>
<thead>
<tr>
<th>Expenditure doubles with aging of society</th>
<th>Unpredictable acute exacerbation</th>
<th>Hidden costs</th>
</tr>
</thead>
</table>
- Emergency hospitalization
- Declining operation rate in ICU

CHF-related expenditure in U.S.

- 5T JPY (2015)
- 10T JPY (2030)

Reference: AHA

Unpredictable acute exacerbation
Expenditure doubles with aging of society
Hidden costs

Cardiac function

Hospitalization

Hospitalization

Hospitalization

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Improvements after Heart Failure and Detection of Acute Worsening

Improve condition from heart failure
- Control heart pressure
  - HeartSheet
- Next gen. regenerative medicine
- Cardiorenal syndrome (Improve blood flow)

Early detection of acute worsening
- Remote monitoring
  - Cloud and AI
  - Proactive care
# Cardiogenic Cerebral Infarction Tends to Have Severe Outcomes

## Expenditure increases with aging of society

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2030</th>
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<tbody>
<tr>
<td>US health expenditure for strokes</td>
<td>7T JPY</td>
<td>18T JPY</td>
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</table>

## Severe and repetitive

<table>
<thead>
<tr>
<th></th>
<th>Recurrence rate</th>
<th>75%</th>
<th>47%</th>
<th>47%</th>
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</thead>
<tbody>
<tr>
<td>Mild</td>
<td></td>
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<tr>
<td>Severe</td>
<td></td>
<td></td>
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<tr>
<td>Death</td>
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</tbody>
</table>

## Hidden costs

- Decline in QOL
- Care burden for family members
- Economic loss from restricted activity

Reference: AHA

Okumura et. al., Jpn J. Electrocardiology 2011;31:292, Hisayama Town Research
Incidence Prevention and Reduced Damage from Aftereffects

Incident prevention

Clot retrieval

Reduced damage

Prevent clot formation

Cerebral artery

Local cell administration (via catheter)
Regenerative Medicine
Evolution of Regenerative Medicine toward Commercialization

**HeartSheet**
- Official approval
- Expanded indications

**Commercialization**
- Allogenic cells
- High volume production

**Expansion to other diseases**
- Candidate diseases
  - Diabetic nephropathy
  - Peripheral artery disease
  - Stroke
  - i.e., local administration through renal artery

Cells
Transforming Engineering
Collaborative Effort in On-site Engineering and Open Innovation

On-site Engineering

- From seeds
- From needs

Open Innovation

- Academia
- Hospital
- Partner companies
- In-house R&D
- Cluster in Israel
- US west coast Ecosystem

New method for value creation

Incubator
Innovating at the Speed of Life

Accelerate R&D through Active Investment

- R&D expense  Double digits growth
- Engineers  Increase 40% from current (1,200)
- Active external investment

Contribute to future of healthcare with significant social impact
Disclaimer

The information that Terumo discloses and the forward-looking statements including financial projections are based upon our assumptions using information available to us at the time and are not intended to be guarantees of future events or performance. Accordingly, it should be noted that actual results may differ from those forecasts on projections due to various factors. Factors affecting actual results include, but are not limited to, changes in economic conditions surrounding Terumo, fluctuations of foreign exchange rates, and state of the competition.

The market share information in this presentation is partly derived from our own independent research.