MAPPING A DIGITAL FUTURE FOR KIDNEY CARE

Expert call | March 29, 2021
Franklin W. Maddux, MD FACP – CMO
Safe harbor statement: This presentation includes certain forward-looking statements within the meaning of Section 27A of the U.S. Securities Act of 1933, as amended, and Section 21E of the U.S. Securities Act of 1934, as amended. Forward-looking statements are inherently subject to risks and uncertainties, many of which cannot be predicted with accuracy or might not even be anticipated. The Company has based these forward-looking statements on current estimates and assumptions which we believe are reasonable and which are made to the best of our knowledge. Actual results could differ materially from those included in the forward-looking statements due to various risk factors and uncertainties, including changes in business, economic or competitive conditions, changes in reimbursement, regulatory compliance issues, regulatory reforms, foreign exchange rate fluctuations, uncertainties in litigation or investigative proceedings, cyber security issues and the availability of financing. Given these uncertainties, readers should not put undue reliance on any forward-looking statements. These and other risks and uncertainties are discussed in detail in Fresenius Medical Care AG & Co. KGaA’s (FMC AG & Co. KGaA) Annual Report on Form 20-F under the heading "Forward-Looking Statements" and under the headings in that report referred to therein, and in FMC AG & Co. KGaA's other reports filed with the Securities and Exchange Commission (SEC) and the Frankfurt Stock Exchange (Frankfurter Wertpapierbörse).

Forward-looking statements represent estimates and assumptions only as of the date that they were made. The information contained in this presentation is subject to change without notice and the company does not undertake any duty to update the forward-looking statements, and the estimates and assumptions associated with them, except to the extent required by applicable law and regulations.

If not mentioned differently the term net income after minorities refers to the net income attributable to the shareholders of Fresenius Medical Care AG Co. KGaA. The term EMEA refers to the region Europe, Middle East and Africa. Amounts are in Euro if not mentioned otherwise.
In 2020 Fresenius Medical Care’s Management Board outlined our company’s strategic vision built around three core areas:

The renal care continuum
Critical care and
Complementary assets.

The organization of the Global Medical Office allows us to comprehensively consider scientific evidence and innovations in order to advance clinical practice on a worldwide basis.
HOW TO ENABLE OUR VISION ON DATA ASSETS?

AS A FULL VERTICAL INTEGRATED COMPANY...

Data analytics teams

Medical experts

Research & development

Production

Health care professionals

~350,000 Dialysis Patients worldwide

>4,000 Own Dialysis clinics in around 50 countries

>50 Mn. Dialysis Treatments in 2020
HOW TO ENABLE OUR VISION ON DATA ASSETS?

...FRESENIUS MEDICAL CARE IS IN A UNIQUE POSITION OF LEVERAGEING ITS VARIOUS DATA POOLS TO PROVIDE INDIVIDUALIZED AND BEST IN CLASS THERAPIES.

- Production and service data
  - Intelligent production and services
  - Predictive maintenance
  - Intelligent production capacity planning
  - Automated testing environment

- Machine and device data
  - Smart machines and clinical workflows
  - Automated alarm management
  - Intelligent Ultra Filtration

- Medical and therapy data
  - Individualized and adapted therapies
  - Reduction of dropout rates in Home patients
  - Individualized comorbidity management
  - Transitional care by data and diagnostics
IN HEALTH CARE, DATA HAS ALSO GROWN EXPONENTIALLY

HOW DO WE MAKE SENSE OF IT ALL?

Electronic Medical Records

Patient Data

Machine Data

Genetics

Environment

Wearables
THE EVOLUTION OF DIGITAL DATA UTILITY

Traditional analytics

Descriptive Analytics

Diagnostic Analytics

Predictive Analytics

Prescriptive Analytics

Advanced analytics

Hindsight

Insight

Foresight

Value

Difficulty
DIGITAL SKILLSETS AND CAPABILITIES NEEDED

**Domain Experts** (e.g., physician)
- define the goal, help other team members to grasp the relevance of real-life questions.

**Data Scientists**
- use analytical and technical capabilities to extract meaningful insights from data.

**Data Engineers**
- ensure uninterrupted flow of data between servers and applications. They are responsible for data architecture.

**Statisticians**
- use theoretical expertise in statistics and apply them to real life problems.

**Mathematicians**
- use mathematical modeling and computational methods to solve practical problems.
CARDIOVASCULAR PROTECTION FOR KIDNEY PATIENTS

1. Preventing cardiac arrhythmia and sudden cardiac death
2. Reversing or modulating cardiac remodeling
3. Controlling sodium excess, fluid volume overload, and hypertension
4. Preventing vascular and valvular calcification
5. Customizing dialysis to patient risk, preference and perception

Improving cardiac outcome
Reducing mortality
BROADEST DATA SET IN THE WORLD ON ADVANCED KIDNEY DISEASE

GLOBAL NUMBERS

- **Patients**: 2,138,564
- **HD treatments**: 567,797,521
- **Labs**: 1,972,926,596
- **Comorbidities**: 36,860,636
- **In-center medications**: 1,548,575,115
- **Home medications**: 2,972,171,527
**OUR CONNECTED HEALTH MACHINE**

**Patient data**
Fresenius Dialysis machine supported by peripherals and Home Patient App collects patient data.

**Kinexus Gateway**
Data is securely transferred via Bluetooth, Wi-Fi or wired.

**Kinexus Cloud**
In secured cloud data is stored and analyzed with medical algorithms.

**Clinical Care**
Have access to analyzed patient data on their computer or mobile device.
**Vision**
Catalyze increased innovation and investment in renal research

**Goal**
Build world largest renal registry; a curated database of clinical and genomic data

**Strategy**
Leverage existing FME’s global footprint, vertical integration and diverse patient population
APPLICATION OF GENOMICS AND PRECISION MEDICINE ASSET AND CAPABILITY BY FMC PARTNERS AND PROVIDERS

**Academic research**
- Causes of kidney disease(s)
- Early diagnosis and monitoring biomarkers
- CKD and ESRD risk factors

**Pharmaceutical R&D**
- New therapeutic drug targets
- Translatable Kidney disease models
- Targeted clinical trials with reduced cost and time

**Patient care**
- Optimized therapies for targeted patient groups
- Improving transplant outcomes with more precise tissue typing/post-transplant care
- Refined risk models and target interventions
### CLINICAL TRIALS BY MEDICAL DISCIPLINE

- **10.9%** Infectious Disease
- **2.6%** Genitourinary
- **11.0%** Autoimmune/Inflammation
- **13.7%** CNS
- **2.5%** Ophthalmology
- **3.2%** Vaccines (Infectious Disease)
- **33.6%** Oncology
- **9.8%** Metabolic/Endocrinology
- **12.6%** Cardiovascular
KEY AREAS OF APPLIED ADVANCED ANALYTICS EFFORTS

- Event prediction
- Treatment Aid
- Condition Diagnosis
- Mathematical modeling and algorithms

Delivery of personalized care and optimization of multiple processes within the business
HOW DOES ARTIFICIAL INTELLIGENCE FIT INTO A DIGITALIZATION PLAN?

**Artificial intelligence**
A program that enables computers to mimic human behavior.

**Machine learning**
Subset of AI that uses statistical methods to build programs and whose performance improves when exposed to large amounts of data.

**Deep learning**
Subset of machine learning in which multilayered neural networks learn from vast amounts of data.
Can we use mathematical principles and create virtual “clinical” trials?
A Virtual Clinical Trial enables testing of multiple interventions in a random large sample of patients.
A standard of care anemia treatment protocol was tested in ~6,700 Avatars for one virtual year and compared to one year of data from ~6,700 anemia patients treated with the same protocol.

**Distribution of hemoglobin values**

**Frequency of ESA dose administration**

MAKING THE DIGITAL DATA APPLY TO CLINICAL CARE

Clinic

Clinician

Mobile application

Patient access image

Image upload via secured messaging

Machine learning model result (Aneurysm category)

STAGE 0
Fistula with normal skin
No action required

STAGE 1
Enlarged fistula with shiny skin
Monitor

STAGE 2
Enlarged fistula with hypopigmented skin
Refer to vascular access team

Machine learning model deployment

Machine learning model result

Fresenius Medical Care Secured ML/AI ANALYTICS Data Platforms (AWS)

Training flow
Real-time flow
### A MODEL FOR COVID PREDICTION RISK

#### INPUTS AND OUTPUT

**XGBoost Model**

**Probability of Active COVID-19 Infection**

<table>
<thead>
<tr>
<th>Prediction</th>
<th>Reason 1</th>
<th>Reason 2</th>
<th>Reason 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.94</td>
<td>Monocytes: Change from previous month = 6.65</td>
<td>IDWG: Change from previous month = -1.82</td>
<td>Albumin: 2-week average = 2.9</td>
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<tr>
<td>0.92</td>
<td>County incidence: 3-day span = 0.001</td>
<td>WBC count: Change from previous month = -3.26</td>
<td>IDWG: Change from previous month = -2.054</td>
</tr>
<tr>
<td>0.91</td>
<td>Monocytes: Change from previous month = 3.375</td>
<td>County incidence: 3-day span = 0.001</td>
<td>County incidence: 3-week span = 0.001</td>
</tr>
<tr>
<td>0.91</td>
<td>County incidence: 3-day span = 0.002</td>
<td>Monocytes: Change from previous month = 4.033</td>
<td>County incidence: 3-week span = 0.001</td>
</tr>
<tr>
<td>0.91</td>
<td>Albumin: 2-week average = 2.6</td>
<td>IDWG: Change from previous month = -4.377</td>
<td>Post-HD Temperature: Change from previous month = 1.108</td>
</tr>
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**Labs:** Recent and trends

**Treatments:** Recent and trends

**Demographics**

**County incidence**

**Text notes**

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**FRESENIUS MEDICAL CARE**

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Your Questions Are Welcome!
**FINANCIAL CALENDAR 2021**

**REPORTING DATES & AGM**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>May 6</td>
<td>Q1 2021 Earnings Release and Conference Call</td>
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<tr>
<td>May 20</td>
<td>Annual General Meeting 2021 (Virtual)</td>
</tr>
<tr>
<td>July 30</td>
<td>Q2 2021 Earnings Release and Conference Call</td>
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<tr>
<td>November 2</td>
<td>Q3 2021 Earnings Release and Conference Call</td>
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**CONFERENCES & MEET THE MANAGEMENT**

<table>
<thead>
<tr>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>May 11-13</td>
<td>Bank of America Merrill Lynch Global Healthcare Conference</td>
</tr>
<tr>
<td>May 18</td>
<td>RBC Capital Markets Global Healthcare Conference</td>
</tr>
<tr>
<td>May 26-27</td>
<td>UBS Best of Europe One-on-One Virtual Conference</td>
</tr>
</tbody>
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Please note that dates and/or participation might be subject to change.
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