



LIVER CANCER

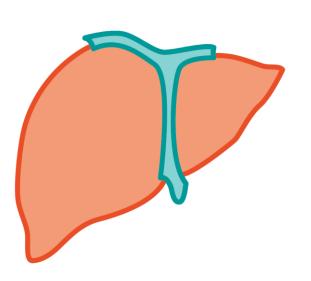
FACTS AND FIGURES

SYMPTOMS INCLUDE¹

LOSS OF APPETITE NAUSEA AND VOMITING UPPER ABDOMINAL PAIN

ABDOMINAL SWELLING **JAUNDICE GENERALIZED WEAKNESS**

UNINTENTIONAL WEIGHT LOSS





Worldwide, ~905,677 people were diagnosed and ~830,180 people died due to primary liver cancer in 2020²

HCC accounts for 90% of primary liver cancer³

RISK FACTORS^{1,4}



- **Chronic infection with HBV/ HCV**
- **Cirrhosis**
- Non-alcoholic fatty liver disease
- **Certain inherited liver disorders**
- **Excessive alcohol consumption**
- **Diabetes**
- **Exposure to aflatoxins**



Exacerbation of existing chronic liver disease and complicated management of cancer in most HCC patients⁵

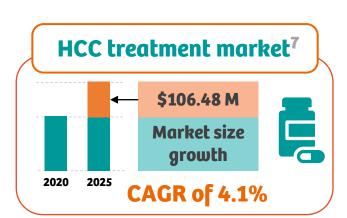


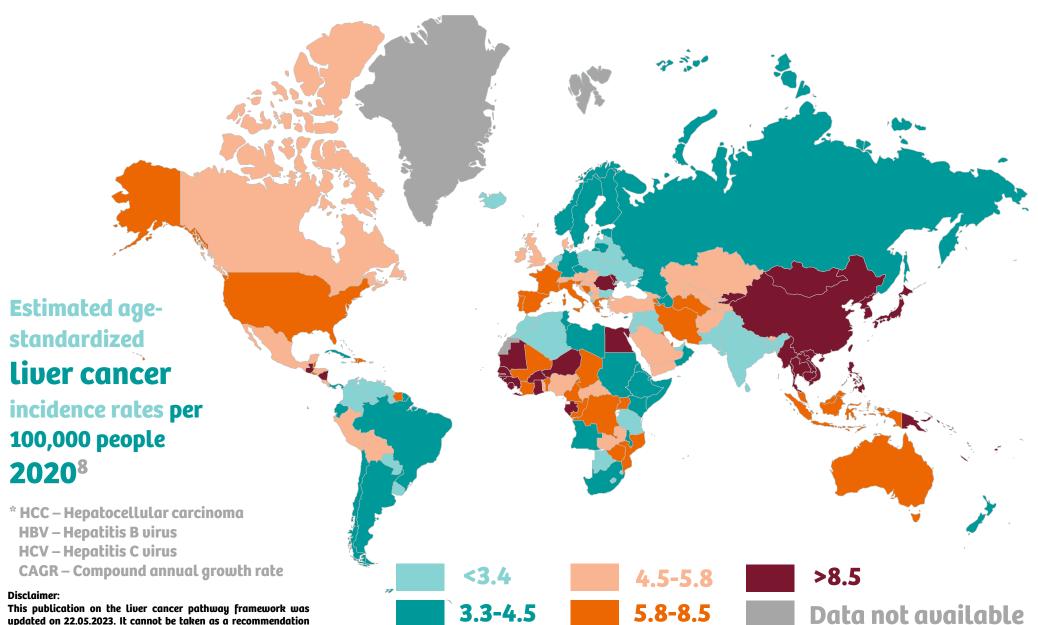
The number of new cases and deaths are predicted to rise by between 2020-2040⁶

Shift in predominant risk factors, with a decrease in HBV and HCV infections and an increase in obesity and diabetes²



in most regions, men have 2 to 3 times higher incidence and mortality rates than women²





updated on 22.05.2023. It cannot be taken as a recommendation for the readers, especially not as a guideline for treatment, and it is not a medical document. There is no guarantee for completeness or global correctness, the various pain points, solutions, and statistical data are examples only. Sources are multiple, such as public statistics, expert opinions, open innovation workshops, research, own data and many more (see references).

The products and features mentioned may not be available in all countries and their future availability cannot be guaranteed. Some products mentioned are planned and under development.

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LIVER CANCER

Disease pathway analysis with pain points and solution examples

research-based analysis from 40+ scientific articles and journals in combination with workflow experience allowed the identification of pain points and solutions.

These solutions were proposed based on AI, IoMT, AR/VR, biosensors, nanorobotics and smart wearable technologies.

THROUGH THIS CAREPLAN WE **HIGHLIGHT DATA FROM** A COLLECTION OF



connected to different stakeholders

Solution categories

Existing in healthcare





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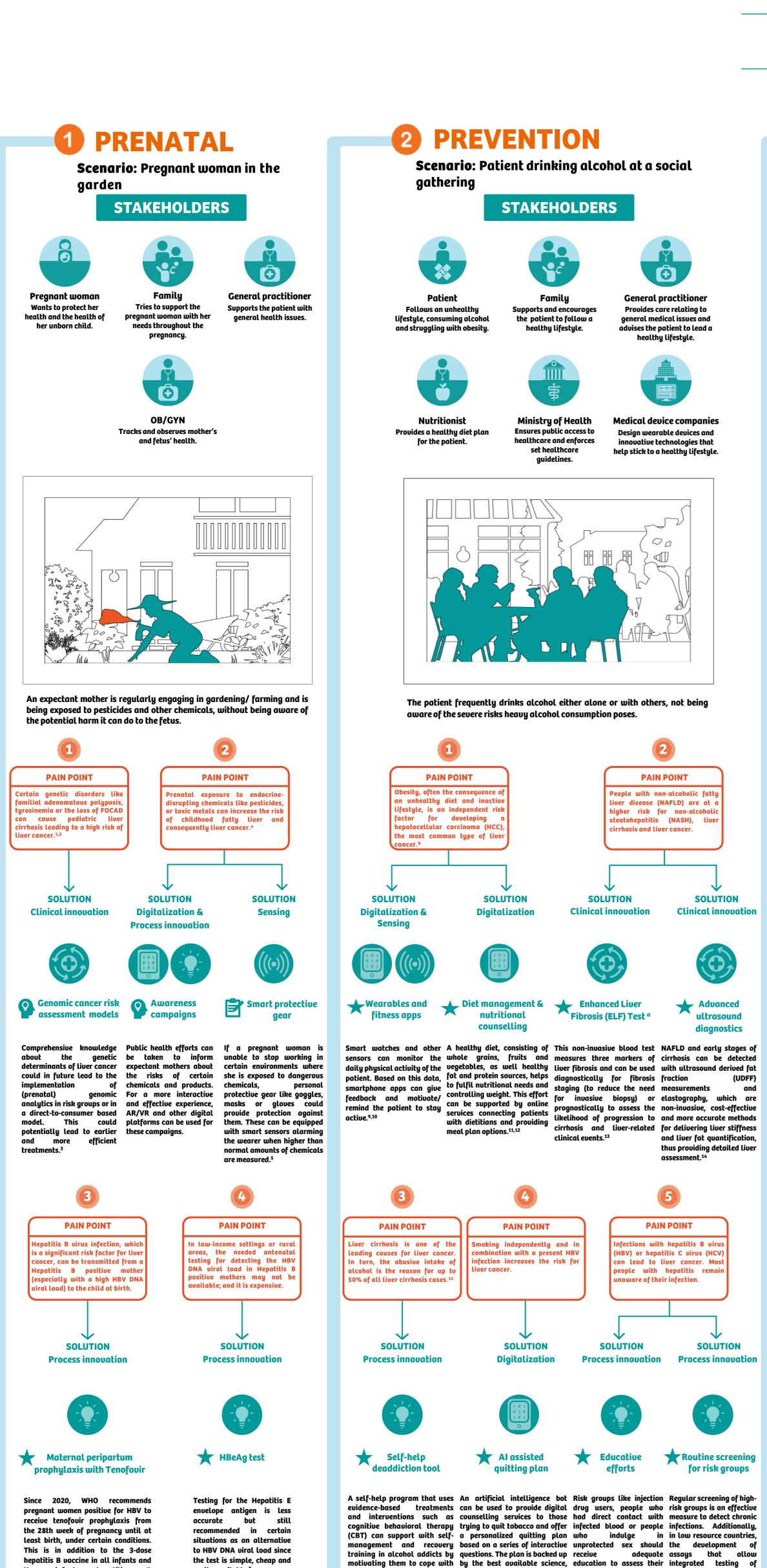
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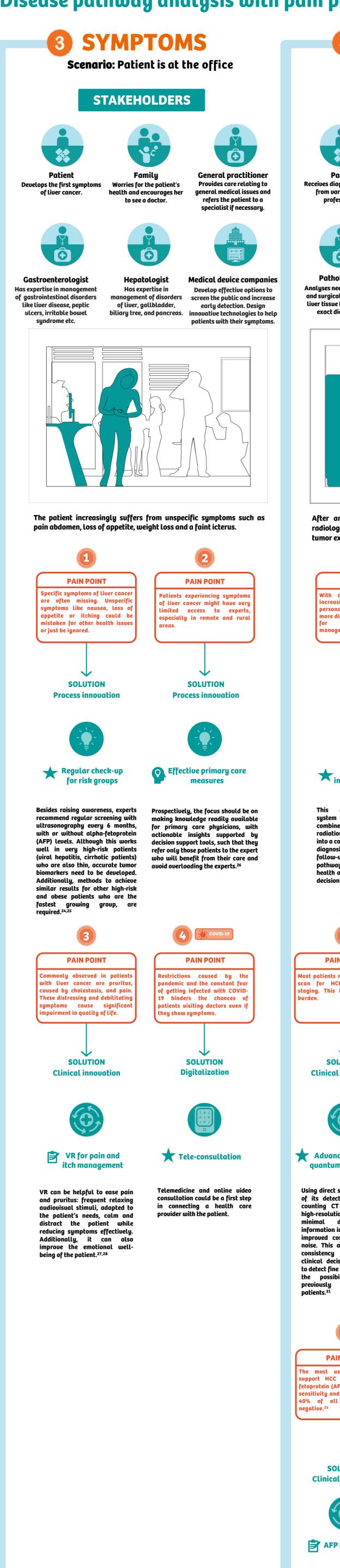
^aELF test (SHS): In the U.S., the ELF Test is indicated as a prognostic marker in conjunction with other laboratory findings and clinical assessments in patients with advanced fibrosis (F3 or F4) due to non-alcoholic steatohepatitis (NASH) to assess the likelihood of progression to cirrhosis and liver-related clinical events. It is not intended for the diagnosis of NASH or for the staging of fibrosis, for serial monitoring of disease progression or the effect of any therapeutic product, for assessing progression to hepatocellular carcinoma, or for assessing disease progression in individuals with viral hepatitis. Product availability varies by country and future availability cannot be guaranteed.

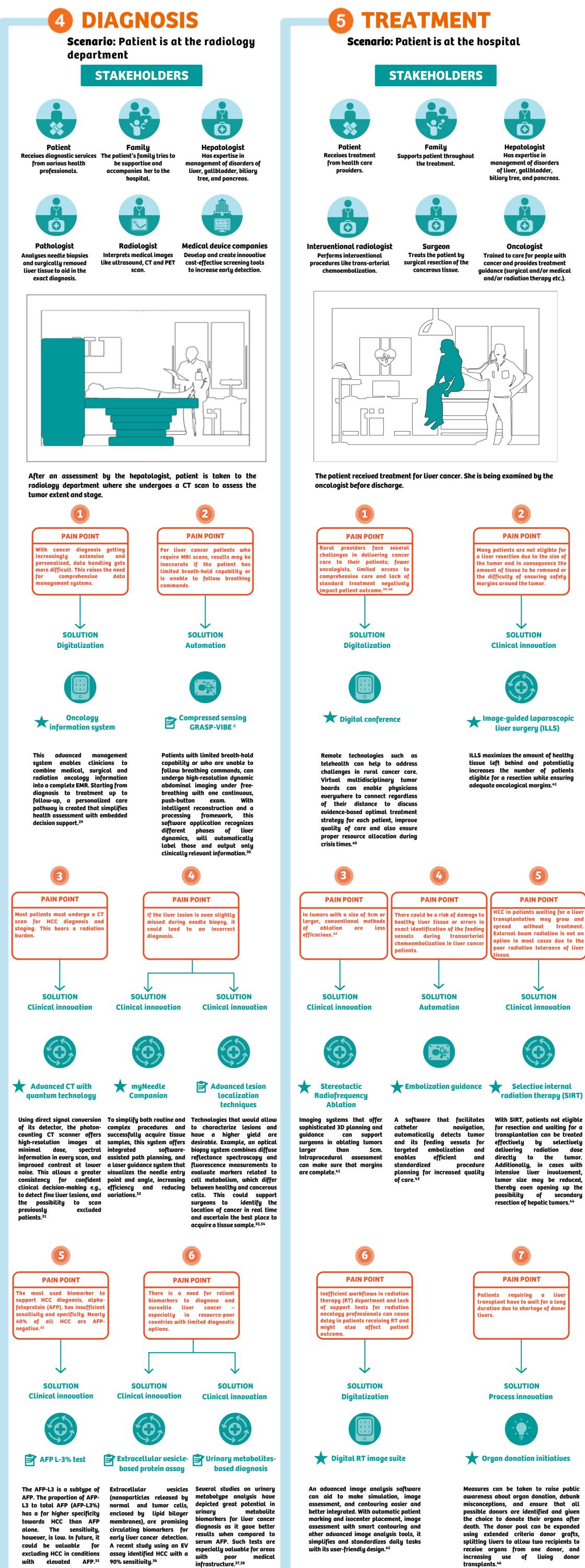
bLiverLab (SHS): The product may not be commercially available in all countries. Due to regulatory reasons its future availability cannot be ^cCompressed Sensing GRASP-VIBE for MAGNETOM Lumina (SHS) is still

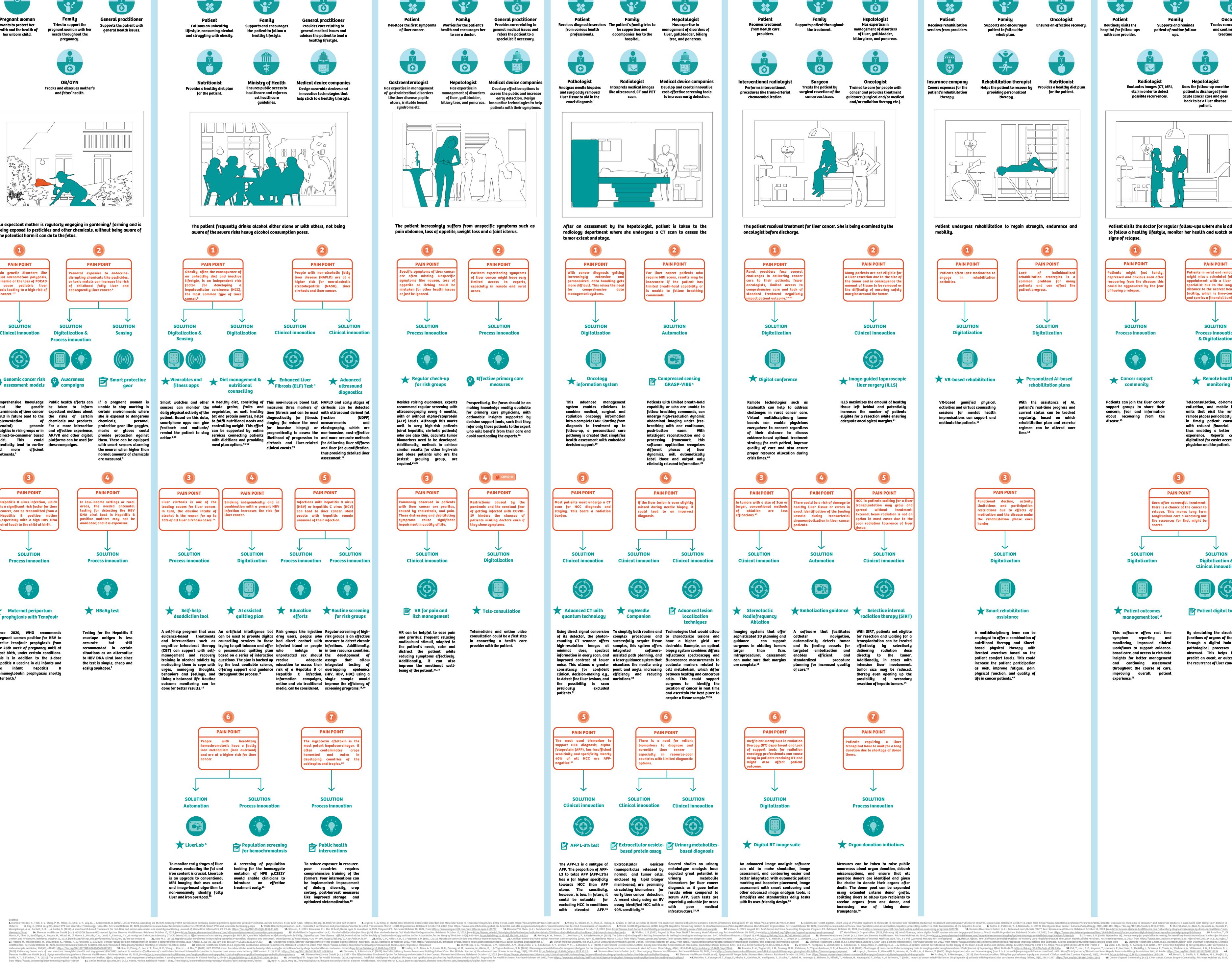
under development and not commercially available yet. Its future availability cannot be ensured. dNoona (Varian): Specifications and prerequisites are subject to change without notice. Noona is not available in all markets.

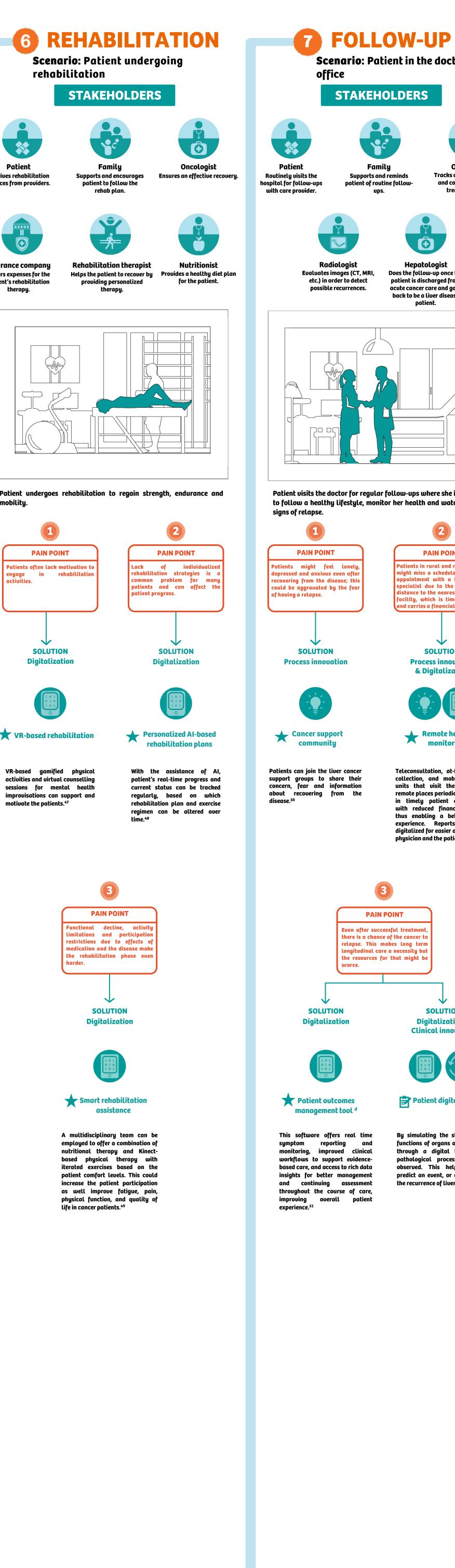
^eDigital twin (SHS): The functionality described herein is solely futuristic and not current product/functionality. Its future availability cannot be











Innovation Think Tank Proactively drive innovation to improve human life







rehabilitation

services from providers.

Insurance compan

Covers expenses for the

patient's rehabilitation

atients often lack motivation

engage in rehabilitation

VR-based gamified physical

activities and virtual counselling

sessions for mental health

improvisations can support and

unctional decline, activ

imitations and participati

estrictions due to effects

medication and the disease ma

the rehabilitation phase ever

SOLUTION

Smart rehabilitation

A multidisciplinary team can b

employed to offer a combination of

nutritional therapy and Kinect-

based physical therapy with

iterated exercises based on the

increase the patient participation

as well improve fatigue, pain,

physical function, and quality of

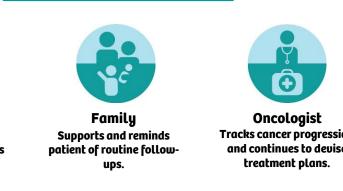
life in cancer patients.49

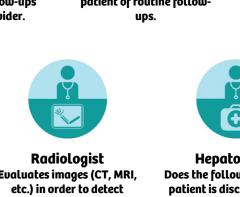
motivate the patients.⁴⁷

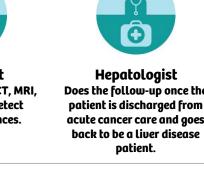
Supports and encourages

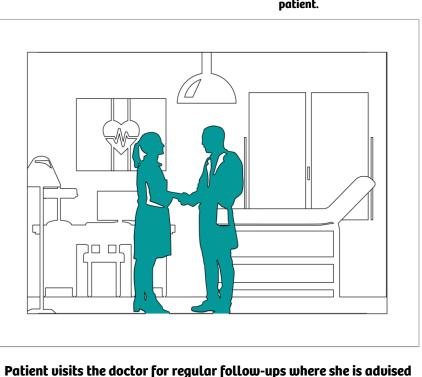
providing personalized

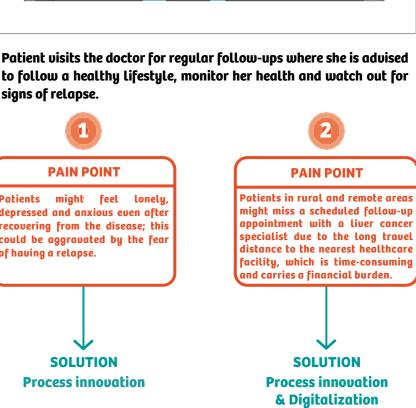
patient to follow the



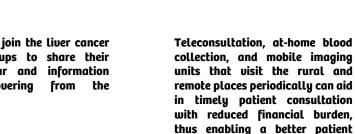


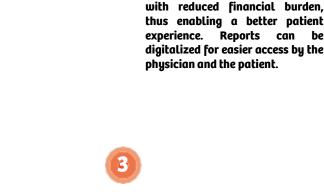




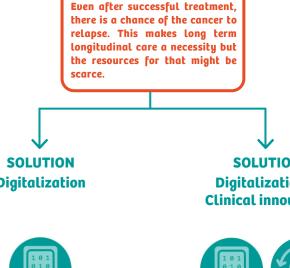






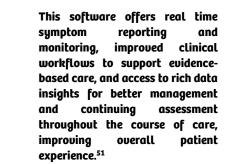


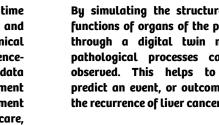
PAIN POINT











through a digital twin model, pathological processes can be observed. This helps to then

the infant hepatitis B

immunoglobulin prophylaxis shortly

easily available.⁷

urges, managing thoughts, offering support and guidance risk of a Hepatitis B or overlapping epidemics

behaviors and feelings, and throughout the process. 17 Hepatitis C infection. (HIV, HBV, HBC) using a

SOLUTION

Process innovation

PAIN POINT

People with heredit

emochromatosis have a fau

iron metabolism (iron overloa

and are at a higher risk for liv

To monitor early stages of liver A screening of population

disease, evaluating the fat and looking for the homozygote

iron content is crucial. LiverLab mutation of HFE p.C282Y

is an upgrade to conventional would enable clinicians to

MRI imaging that uses voxel- introduce an effective

and image-based algorithm to treatment early.21

non-invasively identify fatty liver and iron overload.²⁰

Information campaigns, single sample would

online and via traditional improve the efficiency of

PAIN POINT

he mucotoxin aflatoxin is th

most potent hepatocarcinogen. It

developing countries of the

SOLUTION

Process innovation

To reduce exposure in resource-

poor countries requires

comprehensive training of the

farmers. Four interventions can

of dietary diversity, crop

like improved storage and

optimized nixtamalization.²³

sorting, post-harvest measures

be implemented: improvement

often contaminates crops

harvested and eaten

subtropics and tropics.²²

media, can be considered. screening programs. 18,19

living a balanced life. Routine

outcome monitoring can be