

Culture of Innovation at CHOC

Impact

50+

Associates/providers taught human centered design thinking in 2022

30+

Innovators mentored through office hours

15+

Departments/Specialties actively partnering with Mi4 Innovation Team

7

Innovation hosted events in 2022

Innovation Education, focusing on human centered design thinking, evolving "Innovation Beach" to an updated version designed for all levels of associates and providers

In 2022, **design thinking taught to 2 departments, Future Physician Leaders, through Wave Thinkers cohort, at 5 ideation sessions, and asynchronously via department page**

Innovation Office Hours offered every 2 weeks, with additional sessions added to accommodate provider schedules, including mentorship from 5-6 innovation team members

Supported 30 innovators during innovation office hours, co-working on concepts, tracking status and following up for status addressing problems/challenges and ideas for solutions

Innovation Rounds performed (including 5-6 members of the innovation team in the emergency department and at CHOC at Mission, resulting in multiple projects currently underway based on problems identified

The Innovation Team has completed Innovation Rounds in the Emergency Department with Dr. Heyming and Team, and at CHOC at Mission with Emma's team, resulting in 4 projects currently underway

Innovation Events including annual Innovation Day, XR Play Days, Innovator Spotlights,

7 events hosted by Mi4 benefitting CHOC physicians and associates, including 2 XR Play Days, Innovation Day, Mini Hackathons, Human Centered Design Thinking Education

Innovation Projects

Impact

15+

Departments/Specialties actively partnering with Mi4 Innovation Team

Supporting an increasing number of CHOC departments and specialties in innovative problem solving, locating existing products, identifying co-create opportunities or pursuing creation of new solutions

3+

Close to market (anticipated to reach market in 2023)

Market pathway through Innovation Lab or Mi4 in various stages of development

Supporting “try to buy”, co-create, or research study, Mi4 engages with start-ups and mature companies to address challenges at CHOC. This model has been well-received by industry partners

Through Octane, KidsX and through start-up companies approaching CHOC directly, multiple med tech solutions are under review, determining if they meet needs at CHOC

25+

Med tech companies reviewed in 2022

Department/Specialty problem solving with the Innovation Team – partnering to provide solutions in cardiology, 4 CS specialty clinics, CCMH, CVICU, ED, general surgery, inpatient mental health, NICU, nursing (multiple departments) oncology, surgery center, Thompson Autism Center

CareXR, MoveD, uTine – 6 additional concepts in review by Innovation Lab and supported by Mi4, plus 3 concepts being accelerated by Mi4

Kiddo (Thompson Autism Center), LovedBy/Nudg (asthma and diabetes), Miku (NICU), Nicolette (NICU), SmileyScope (oncology), Sonavi (Pulmonary), Vitls (CCMH), with 5 additional companies in review for pilots

A few of the companies under review include Elemeno, Nihon Kohden, NSite, Neosoma, Renata, Sira Medical, and SpineX

7+

Active pilot projects underway with industry partners

Extended Reality (XR) at CHOC

6

Unique/custom
CHOC modules
deployed

Launched in 2020, CHOC Mi4 began **co-creating AR modules with Eon Reality**, focusing on patient and family experience, patient anxiety, and parent/patient education – these unique, innovative modules each include their own metrics and are being featured in multiple marketing stories, demonstrating differentiation at CHOC

Partnering with **Innovation Lab and BioFlight VR** creating CareXR parent education modules for commercialization (Dr. Chogle and Wanda Rodriguez)
Partnering with **SmileyScope** to co-create new modules
One Wish proposal submitted for VR module addressing workplace violence

Leading **CHOC XR Workgroup**, co-leading **iSPI XR Workgroup** and hosting events at CHOC including XR Play Day to promote innovative uses of augmented and virtual reality at CHOC

14

New modules
in
development

12+

Departments/Specialties supported

4 cardiac modules for parent education (+ adding new modules)
MRI with Choco addressing patient anxiety
Choco's Sea Adventure at CCMH for early ambulation
12 modules in process: including Emergency Department, Operating Room, 4 specialty clinics, 5 modules for general surgery, and oncology

Worked with cardiology, endocrinology, gastroenterology, general surgery, specialty clinics (CS managers), surgery center, Thompson Autism Center, NRIC and others in utilizing AR/VR to solve problems

In concert with IT, drafting proposal for a **CHOC Extended Reality Studio** to submit to ELT for approval

Impact

3

Industry partner
co-creation
opportunities

Medical Intelligence at CHOC

30+

publications

The team has completed over **30 publications**, including those supporting trauma center designation, along with recent article published in Pediatrics on neonatal COVID, also featured in AAP newsletter and blog

Deployment and development of AI algorithms for application in clinical settings are increasingly the focus, with several projects deployed at CHOC and multiple others in development

Education in medical intelligence reduces implementation barriers and increases engagement and buy-in. Education is provided at CHOC and through scholarships offered at CHOC or through societies that we have launched

Collaborative projects continue to grow, largely through relationships garnered through our society relationships

8+

algorithms deployed or in development for use at CHOC

35+

Providers and associates that have attended AI education sessions

More than 30 publications completed with several others in process

Successfully deployed **Readmission and ED sepsis models** at CHOC, and finalizing several others for deployment, including **Rising Risk, neonatal and oncology models, inpatient sepsis, and model for scoliosis bracing and another related to IBD**

Through Sessions at CHOC, as well as through ABAIM, AIMed and MIS, we have provided education in AI to **over 35 providers in 2022, and will continue to expand this number in 2023**, providing increasing opportunities for education which fosters adoption

Collaborative projects include our **Moon-Shot mission, multiple projects with Cerner, NLP algorithm with LPCH, UCI, NYU and UGA**

Impact

4+

Collaborative projects underway

Medical Intelligence – Global Stage

Impact

35+

CHOC
Providers/Associates
attended AI education
sessions in 2022

ABAIM, ACAIM/PCAIM, AIMed, Medical Intelligence Society (MIS)
education sessions offered to CHOC associates and providers

Medical Intelligence **keynotes, panels and talks** provided at industry
conferences, primarily by Dr. Chang

Publications, textbook, journal articles created by Mi4

ACAIM/PCAIM was formed by Mi4 in 2021, with the goal of bringing
together centers from around the globe to share best practices and to
develop a white paper to remove barriers to adoption of AI

60+

ACAIM/PCAIM
centers

24+

Keynotes, panels
and talks
representing CHOC
and Mi4

Continually providing **educational opportunities** to CHOC providers
and associates in a variety of venues, most recently with MI10's AI for
Healthcare Executives with over 35 CHOC attendees in 2022

Medical Intelligence **keynotes, panels and talks** provided at industry
conferences, primarily by Dr. Chang

Publications, textbook, journal articles created by Mi4 continue to
increase, with over 15 this year alone

Growing each month, ACAIM/PCAIM members continue to grow, with
over 60 centers from around the globe. In addition to sharing best
practices and projects, Dr. Chang is leading the group to create a
groundbreaking white paper

15+

Publications and
articles, including a
new textbook
underway

International Society of Pediatric Innovation

Impact

2015

Founded
by CHOC

Convenes senior-level administrators, clinicians and industry partners to share best practices, de-risk new business models and technologies, and accelerate change for pediatric healthcare through spotlights, open forums, conferences, surveys, partnerships and collaborative projects

ISPI workgroups for nursing innovation, extended reality, wearable sensor devices, and innovation education – CHOC actively participates in all iSPI workgroups, leading several of them

CHOC created and launched the **internship toolkit** for the ISPI member hospitals to scale the model of innovation education for healthcare students everywhere

First of its kind **Moonshot Mission, AI4Kids** aims to link all children's hospitals through edge cloud devices and hospital imaging technology (ECHO, U/S, CT, MRI) creating a new network enabling AI applications through federated learning

35+

Member
hospitals &
partners

3500+

PEDS2040
attendees
from 7 conferences

78%

are senior
administrative or
clinical leaders

Weekly access to ISPI officers' meeting for rapid input on high level issues in pediatric health. Monthly Open Forums to take a deep dive into problems needing validation and solutions -from multiple centers- open to all CHOC leaders

Leaders from members hospitals in the network have consulted with Mi4 Innovation Team, nursing, DEI, research, IT, Child Life, and other departments at CHOC for problem solution, project creation and best practice insights

Access to international stage at Peds2040, allowing CHOC to showcase our innovation projects, and engagement from associates and providers as attendees

Preparing to launch additional joint projects research, AI and innovation, including opportunities for joint grant submissions, creation of a pediatric venture capital fund, and the opportunity to participate in several groundbreaking innovative projects

4

Multi-center
projects launched
in 2021-22

Summer Internship Program

Impact

750+
graduates

150
mentors

97%
Actively pursuing
healthcare careers

5
MI2 clubs at
universities and
medical schools

8-week summer internship granting clinical shadowing, mentorship, and education in human-centered design, machine learning, data science, AI, pediatric medicine and emerging technologies

Starting with 1 intern shadowing Dr. Chang in clinic, the MI3 summer internship has grown year over year. We **receive 400+** applications each year through word of mouth and reputation

Includes upper-level **undergraduates and pre-medical and nursing students, reserving 20% of the slots for select high school students** (including slots for underserved, including Samueli Academy students)

Collaboration with Dr. Herbert has bolstered **Mi4's DEI efforts and fostered inclusivity and equity** from the selection process to the cultural aspects of the program

Data Science track added in 2020 and continues to evolve with additional AI, research and informatics projects

Interns submit **abstracts (top 10 present at grand rounds)** They enter **innovation projects into our innovation portal** for commercialization evaluation

Created an **internship toolkit for ISPI members** to scale the model of innovation education for healthcare students, and planning for intern exchange opportunities

We **remain connected** with interns through project continuation, our active LinkedIn page, and CHOC also employs several past interns

CHOC has positively impacted over 750 future healthcare providers and executives