Patient Flow Management

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Enhancing Patient Access through Automation and Optimization of Patient Flow Management

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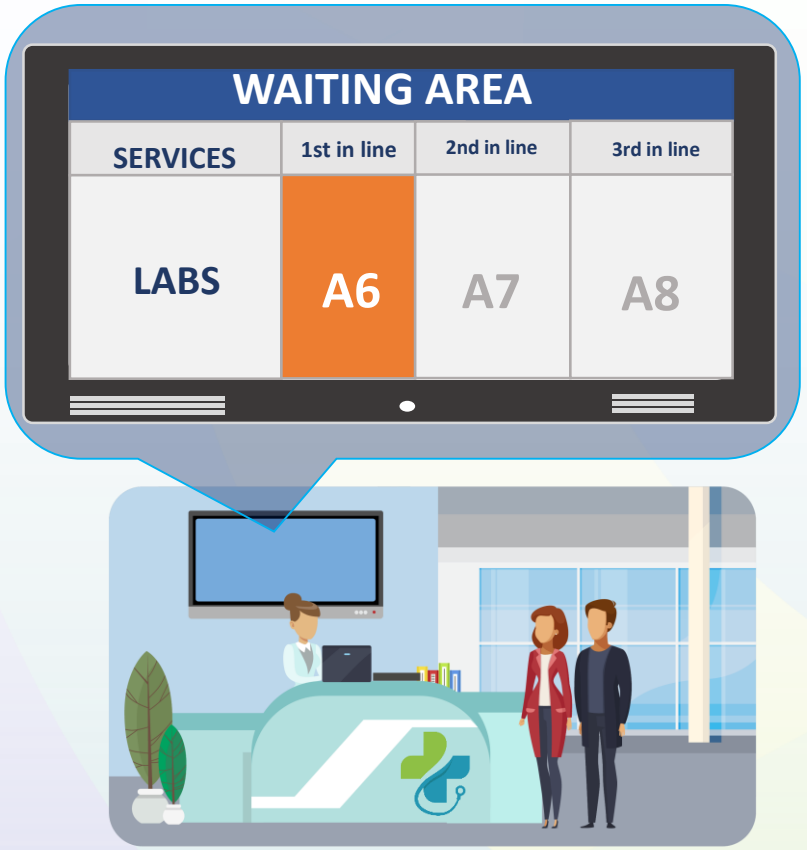
Next Generation Patient Flow
Public Health Enterprise



- Virtual Health
  - Scheduling > Service (Screening + Encounter) > Follow Up
- Location Aware Routing and Navigation
  - Physically getting patients to their points of service
  - Far-forward arrival
- Predictive Modeling
  - Forecasting load, proactively preparing for service needs
- Seamless User Adoption
  - Intuitive interfaces for staff, patients and administration

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Case Study:

US Dept of Defense Healthcare (DHA)

- Created by merger of AF, Navy and Army healthcare; consolidated services as of Oct 1, 2018
- Government-run worldwide health system for 9.4M beneficiaries
- Additional collocated system with VA adds up to 9M additional

Consolidation of these healthcare systems grants opportunity for process innovation

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DHA Patient Flow Benchmark Goals:

- **Standardization**
  - Patient Experience (user adoption)
  - Staff Training
  - Data Accumulation

- **Increase Capacity**
  - Address inefficiencies by load balancing patients
    - Smart Routing; Virtual Health
  - Improve patient adherence to arrival / schedules
    - Location awareness, Virtual Interactions (arrival, bot tools, etc)

- **Reduce Costs**
  - Automation and Interfaces
  - Consolidation and Centralization of Technologies

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Virtual Health Use Case

- Location A has long wait times and / or is lacking ***access** to doctor
- Locations B, C and D have capacity to see more patients, or have specialty doctor available to assist remote locations
- Using technology to facilitate the interaction, enable patients in Location A to be scheduled, served and facilitate follow-up by doctors in other locations, while preserving the GP relationship

* Lacking access implies specialty providers are widely dispersed and may not be available at each MTF (clinic, hospital & medical center)

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Virtual Health Business Case

- Optimize Resources and Skillsets to serve greater numbers of patients, reduce operational costs and reduce travel burden
- Reduce wait times by enhancing availability of provider services
- Load balance throughout the enterprise & redefine the enterprise from local > regional > enterprise wide
- Enable tools to address schedule disruptions from cascading
- Do all of the above while enhancing the quality of care
- Do all of the above while easing training burdens for staff

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Location Awareness: Use Case

- Goal is to provide patients usable tools to encourage efficient navigation
- In relation to ever-changing infrastructure / facility maintenance / construction:
  - Orient patients to the best parking area > entrance for their service
  - Enforce routing rules: e.g. Step 1 Registration, Step 2 X-Ray, etc.
  - Incorporate traffic, public transit and related dynamic tertiary events
- Enable seamless patient arrival, including profile push, appointment check-in, etc.

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Location Awareness: Business Case

- Encourages the schedule, thereby reducing cascading lateness and related disruptions
- Navigation is among the most ubiquitous examples of user adoption; leverage it to build a touchpoint with the patient population
- With greater usage comes enhanced data modeling
- True patient tracking while preserving privacy

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Challenges

- Technology is needed for composite appointment management that aligns patient needs with multiple specified resources
- Additionally, the same technology should serve spontaneous walk-in patients in harmony with the schedule (load balancing resources)
- Staff empathy is needed to ensure systems works for them, rather than staff working for the systems
- Patient adoption of the tools will work if they benefit the patient, not just the system
- Processes must developed with specific technology in mind, vs developing processes and then seeking technology to fulfill

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Data Modeling: Applying the by-product of the tools

- Vast data collection in a very specific and largely untapped categories:
  - Wait times
  - Service Times
  - Resource Utilization
  - Staff Performance

- Example Use Cases:
  - Forecasting and Modeling Scenarios
  - Econometric analysis based on actual utilization (idle, in service, dwell metrics)
  - Budgetary planning and optimization for capital expenditures

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Data Modeling: Examples

- What are impacts to wait times by extending service hours
- What are impacts to wait times by adding staff
- What are impacts to wait times by opening additional locations

- What are impacts to wait times by closing a location
- What are resource requirements to meet wait time goals

- What are best ways to optimize staff (who performs best at which tasks)

- What areas of training are needed for staff
- Where are primary sources of late arrivals?

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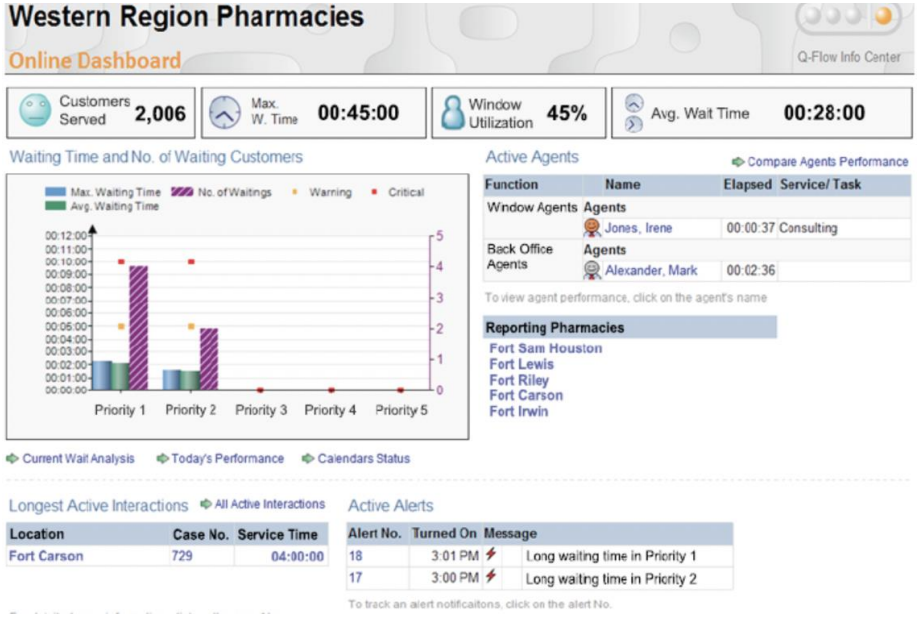

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Real Time Applied Data Modeling

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Results: **Logistics Automation and Resource Optimization** in Patient Flow

- Virtual Health: Load Balance to increase capacity, automate processes and dynamically address services based on patient behaviors and enterprise resources
- Location Awareness: Dynamically navigate patients and automate trigger events for staff, patients and core care tools
- Data Modeling: Forecast predictive scenarios to assess service impacts, costs and behaviors, thus fostering greater optimization
- User Adoption: Useful, intuitive and seamless tools for staff and patients foster adoption and lead to ubiquity, thus further enhancing the cycle of automating processes in optimization

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