

Beamtree®

Ainsoff Deterioration Index

Intelligent Patient Acuity Monitoring

Service Definition Document

April 2024

Table of Contents

Introduction to the Ainsoff Deterioration Index (ADI).....	2
What is the Ainsoff Deterioration Index?	2
Key Features of ADI.....	4
Clinical Trial Results	4
ADI Onboarding.....	6
ADI Offboarding.....	7
Data Destruction Attestation	7
ADI Service Levels and Support.....	7
Service Levels	7
Service Request Classification	8
Software Defects and Enhancements	8
ADI Updates and New Releases.....	9
ADI Maintenance Windows	9

What is the Ainsoff Deterioration Index?

Built with historical data from over 300,000 Australian patients, the ADI dashboard displays a visual summary of acuity for all patients at ward and hospital level. Accompanying analytical views further guide organisational insight to workload and risk. Real-time alerts are generated for patients at the highest risk of deterioration. The sensitivity and accuracy of the tool means that alerts are only generated for patients genuinely at risk of deterioration, far enough in advance to enable clinical teams to act and prevent serious outcomes and long-term issues.

General Hospital

Ward : 2CCC

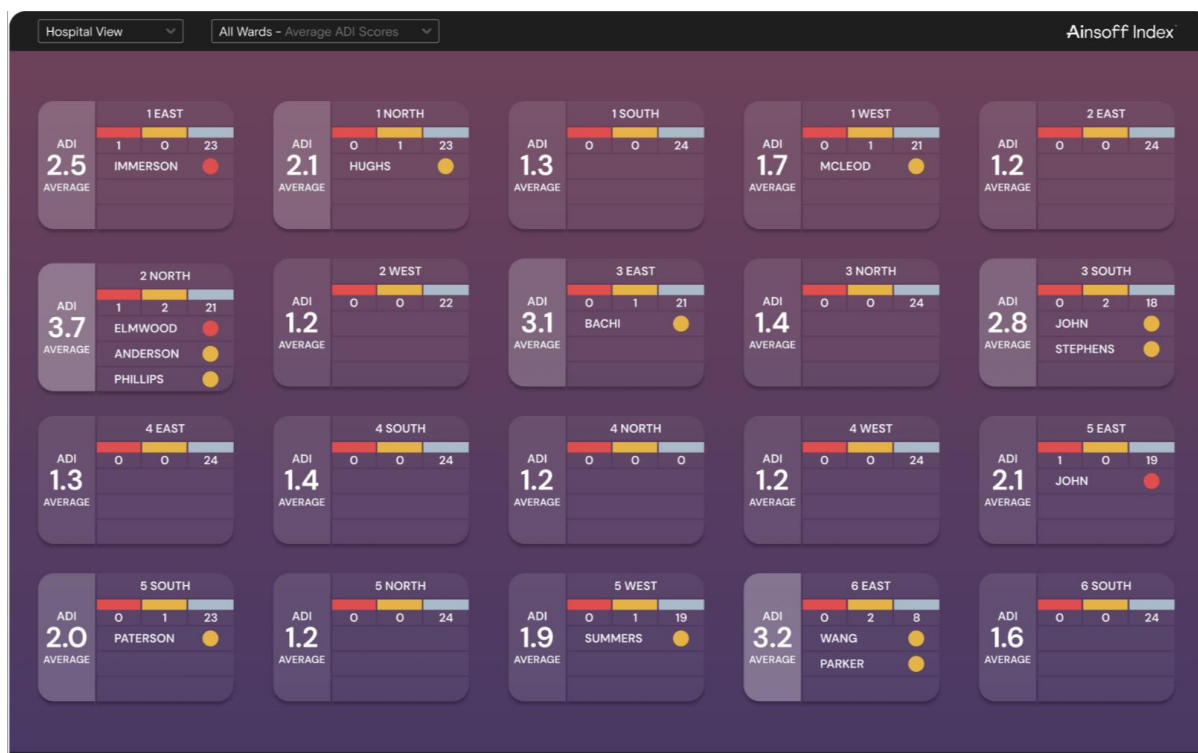
Last updated 11:38 AM (Tue 29 Aug)

Change ward

Search by patient or bed

LANDA	DREBIN	VENTURA	BURNHAM	RED	POULAIN
1-1	1-2	2-1 Palliative	3-1	4-1	5-1 Palliative
ADI : 5	ADI : 6	ADI : 8	ADI : 3	ADI : 4	ADI : 5
EVERDEEN	BANE	CORLEONE	E.T.	AMERICA	MCFLY
6-1	7-1	8-1	9-1	10-1	11-1
ADI : 3	ADI : 3	ADI : 3	ADI : 3	ADI : 6	ADI : 4
GROMIT	DEVITO	BLAINE	LANDA	RED	MONTOYA
12-1	13-1 Palliative	14-1	15-1	16-1	17-1
ADI : 1	ADI : 7	ADI : 4	ADI : 5	ADI : 5	ADI : 6
BLANK	DUNNE	GAMGEE	MONTANA	E.T.	DARKO
18-1	19-1	20-1	20-2	20-3	20-4
ADI : 8	ADI : 4	ADI : 1	ADI : 1	ADI : No data	ADI : 5

Figure 2: ADI dashboard view – Ward level view



In addition to the dashboard display, Real-time alerts are generated for patients at the highest risk of deterioration. The sensitivity and accuracy of the tool means that alerts are only generated for patients genuinely at risk of deterioration, far enough in advance to enable clinical teams to act and prevent serious outcomes and long-term issues. Alerts can be sent to medical or nursing staff as required by each hospital setting in accordance with existing pathways, and the patient's goals of care, and includes a clinical summary to support the escalation.

Figure 3: ADI Dashboard – Patient level view

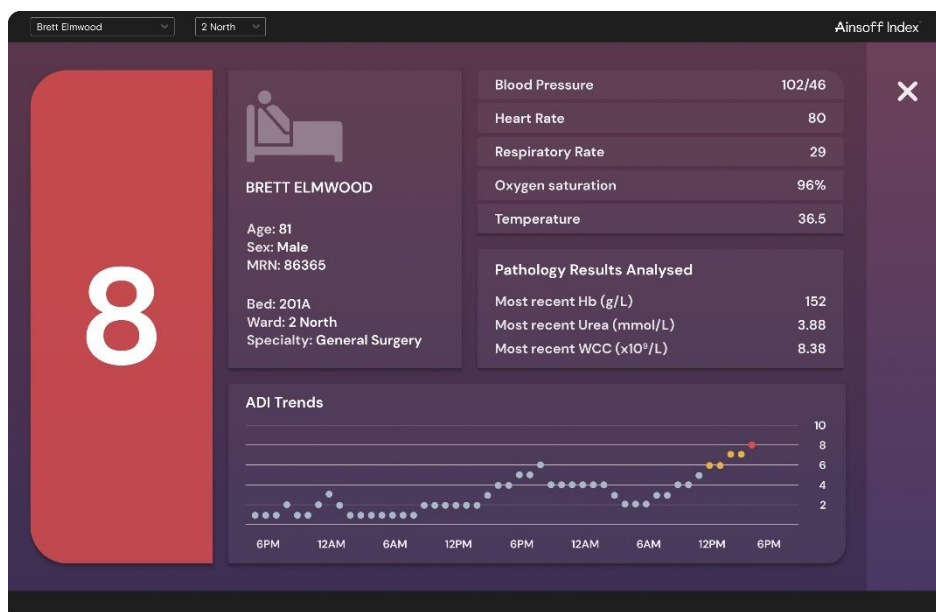
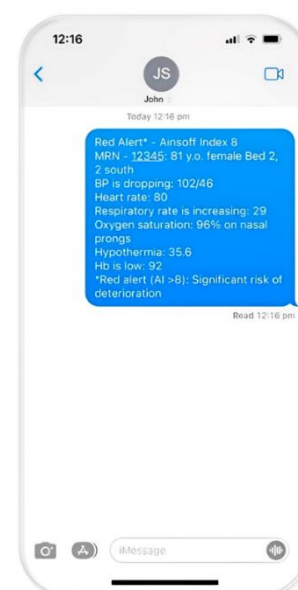


Figure 4: Sample SMS alert



ADI provides a safety net for junior medical and/or nursing staff who may not have experience detecting trends in the deteriorating patient or where junior medical staff are not available.

The capability of the algorithm has been tested in silent trial in various geographies and patient populations including Southeast Asia and the UK and maintained its predictive capability across varied population ethnicities.

Key Features of ADI

Key Features

- 1. Hospital, ward, and patient level Acuity summary dashboard views**
 - 2. A simple, numeric score of each patient's risk of a major adverse event**
 - 3. Proven early detection and push notification alerts for patients at risk of deterioration in real-time**
 - 4. A useful clinical summary in the alerts and dashboard views**
 - 5. Proven implementation, support and monitoring**
-

Clinical Trial Results

A Clinical trial published in 2023 (Bassin et al, Resuscitation) the ADI was found to directly impact hospital outcomes, including a 20.4% reduction in unplanned intensive care admissions, a 17.4% decrease in rapid response team activations and a 5% decrease in length of stay across the hospital.

Table 1: Outcomes from 2023 journal article in Resuscitation

Outcomes from a 10-month clinical trial at a 500-bed hospital

Trial assessed patient outcomes before and after implementation of the ADI at the Sydney Adventist Hospital. The study included data from 28,639 patients.

Clinical outcomes

- 16.7% reduction in the composite outcome of Major Adverse Events (death or unplanned ICU admission or Medical Emergency Team activation)
- 19.3% reduction in significant hypotension (systolic blood pressure <80 mmHg)
- Predicted 76% of patients that passed away >24 hours in advance compared to 18% for Between the Flags
- 17% reduction in Medical Emergency Team activation

Operational outcomes

- 5% reduction in length of stay – 0.3 days reduced length of stay per patient admission
- 20.4% reduction in unplanned ICU admissions

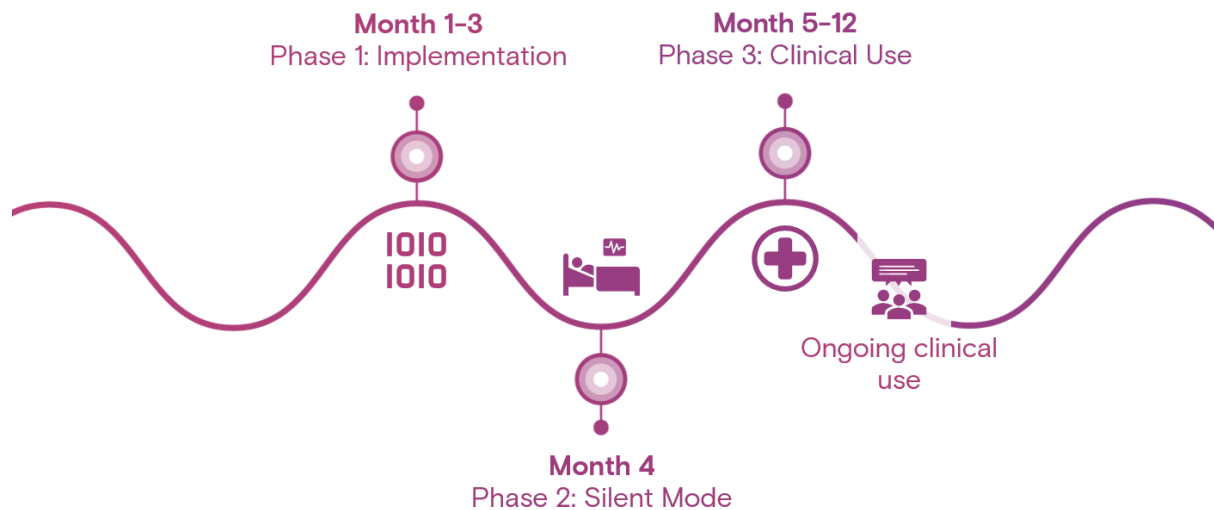
For example, in a 500-bed hospital, with 15,000 overnight admissions per year this would equate to: **165 fewer ICU bed days and 4,500 fewer ward bed days per annum.**

Publications: Resuscitation 2023 ; Critical Care Medicine 2021

ADI Onboarding

ADI is delivered in 3 short phases:

- Implementation (1-3 months)
- Silent Mode (2-4 weeks)
- Move to Full Clinical Use (4 weeks)



A project implementation timeline (1-3 months) will be agreed, to include all activities required to enable technical set up and clinical use, including:

- IT and Security Review
- API data feed set up and testing
- Model tuning
- End user training

The data required to be sent to the ADI end point is shown in the table below:

Ainsoff Index™		
Mandatory real time data	Highly desirable real time data	"Nice to have"
Required Vital signs • Oxygen Saturation measurement • Systolic Blood pressure • Diastolic Blood Pressure • Pulse Rate • Respiration Rate • Temperature	Pathology / Blood results • Haemoglobin • White cell count • Urea	Pathology / Blood results • eGFR • C Reactive Protein • Lactate • Blood Glucose
Demographics/Other • Name • Date of birth, sex • Site, ward, bed, specialty • Patient and visit identifiers	Demographics/Other • Resuscitation status • Outcome e.g Death, Unplanned readmission	Demographics/Other • Supplemental oxygen type
	Batched async data possible Demographics/Other • Outcome e.g. Death, Unplanned readmission	
Note: Outcomes data e.g death, unplanned readmission is required but may be supplied non real time		

ADI Offboarding

The client offboarding process for ADI is outlined below:

1. Client notifies Beamtree of intention to not renew subscription in writing by set date. Access to data or a copy of data can be requested at this stage*.
2. Beamtree disables data ingestion for client organisation on agreed date, and licence key is disabled. This will also disable client access to front end application(s).
3. Beamtree disables client access to application on agreed date, and creates a copy of data or deletes all data stored by Beamtree.
4. Access to or copies of data provided to client (if requested / agreed).
5. Attestation letter is provided to client confirming all data held by Beamtree has been deleted (where data is deleted) within 60 days of agreed contract end date.

*Any requests by a client organisation at the end of the contract to access or obtain a copy of data will be at additional cost, agreed based on what level of access or volume of data is requested.

Data Destruction Attestation

Beamtree will confirm in a written attestation to the client organisation that it has complied with the request for data destruction and made all effort(s) to destroy or permanently delete the client's data from any media on which the client data is stored, all client data in the possession or control of Beamtree or any personnel or subcontractor as required by the agreement.

ADI Service Levels and Support

A service request may be created by the Licensee through the Client Portal. Beamtree monitoring may also detect a service fault and create a service request ticket for tracking purposes

Beamtree will provide access to Software Support Services during regular business hours.

Service Levels

The support levels described below will be applied for any problem or issue escalated through the defined support levels. The activities identified are the minimum required and may be supplemented by further actions during the course of the problem investigation in order to expedite a resolution.

- **First-level Support:** Beamtree will provide basic help desk services, and this will typically include initial call handling, call logging, assignment of call priority (Critical, Major, Minor and Limited) and queue placement and escalation to second-level support as required. This level will also include initial problem diagnostic services for identifying problems and generic application faults, analysis and if possible, problem resolution.

- **Second-level Support:** Beamtree will provide second-level support. Second-level Support will provide more detailed problem diagnostic services as well as any problem duplication for identifying complex problems and Licensed Software Defects that cannot be resolved by the first-level support. Second-level support includes the application of any Updates that the Licensee support is able to implement. Second-level support will also provide interface and escalation to third-level support as required.
- **Third-level Support:** At its own cost, Beamtree will engage a support specialist or third party, for product design problem analysis, and to formally escalate problems. Third-level Support will include provision of reasonable levels of technical assistance to the Second-Level Support organisations and timely delivery of Updates, patches or hot fixes and associated User Documentation.

The client will be given a Service Request number and will be provided with regular status and progress updates of client-escalated problems.

Service Request Classification

Beamtree defines four classifications of Service Requests. In order to classify a request, the client's technical contact will confirm with Beamtree the impact of the problem and recommend an appropriate classification. Where Beamtree and the client disagree on the classification of a particular problem, the client and Beamtree's primary technical contacts will undertake to work on the problem based on the client classification recommendation. In the case of a classification disagreement, review of the classification will occur as a follow-up activity, prior to the final closure of the Service Request.

- **Critical Priority:** Service Requests that have been verified by Beamtree as problems affecting critical business functions, which cause major functionality to affect service for the client. There is no acceptable workaround.
- **Major Priority:** Service Requests that have been verified by Beamtree as problems affecting data corruption or prevents volumes of transactions from being processed or otherwise causes a major disruption to business operations, which cause major functionality to affect service for the client. There is an acceptable workaround that allows the client to restore service.
- **Minor Priority:** Service Requests that have been verified by Beamtree as causing particular features or functionality to be inoperative, but do not affect service for the client. There may or may not be an acceptable workaround.
- **Routine:** Service Requests that are verified by Beamtree as being cosmetic, minor or enhancements which will be considered for inclusion in future new releases or updates.

Software Defects and Enhancements

Beamtree will provide to the client corrections of defects in the ADI application. Beamtree may provide periodic updates of the ADI software that may incorporate:

- corrections of any defects;
- fixes of any minor bugs; and
- at the sole discretion of Beamtree, enhancements to the Licensed Software.



ADI Updates and New Releases

Beamtree may make available updates and/or new releases for the ADI software during the term of the agreement. All updates and releases will be communicated to clients via release notifications within the Client portal. For significant updates or changes, additional client training support such as explainer videos or demonstrations will be made available.

ADI Maintenance Windows

Beamtree may be required to perform maintenance operations for the ADI software, which may affect the continuous operation or functioning of the ADI software.

Beamtree will provide the client with at least 7 Business Days' prior written notice of the maintenance downtime, except when circumstances beyond the control of Beamtree prevent it from doing so.

Where there is an unforeseen outage of the ADI software, Beamtree will notify the client via an email alert.