

# ALARMS

BETA

For anticipating and remembering



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## For anticipating and remembering

Pedagogical guide for use by people with autism and/or  
intellectual disability



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## ■ Introduction

The ALARMS application is a powerful tool to provide people with autism the means of anticipating and preparation they need for certain events. It has also been designed in order to provide information which may be important to remember at certain moments. This information may relate to a forthcoming activity, with messages directed at the person relating to what he/she needs to do, or simply to prepare him/her to handle change more calmly.

In particular, the application has been devised for use in:

- Transitions between activities
- The start of certain routines
- Reminders of actions to be completed

The Tutor of the person with autism must prepare the ALARMS beforehand in order for them to appear at the required time. All programmed ALARMS can be preceded by a warning and a timer (similar to those used in the TIC-TAC application) to facilitate preparation for the key moment. Likewise, the presentation of the ALARM can be accompanied by the sequence of pictograms to provide instructions about what the person is expected to do when the moment arrives.

## ■ **Who ALARMS is for**

The ALARMS tool has been created for use by people with autism spectrum disorders and/or intellectual disability, who may present perceptive and/or sensory problems.

### ● **Autism Spectrum Disorders**

Autism Spectrum Disorders (ASD) is a relatively recent term used to describe people with a series of characteristics in common. These characteristics are known as the “triad of impairments” [1]. These people are affected in their ability to [2]:

- a. Understand and use verbal and non-verbal communication
- b. Interpret social behaviour, affecting their ability to relate to children and adults.
- c. Think and behave in a flexible manner, for example, to adapt their behaviour to specific situations.

People with Autism Spectrum Disorders can be extremely different in terms of their abilities and their strong and weak points. Asperger’s Syndrome, High-Functioning Autism, Classic Autism and Kanner’s Syndrome are considered to be sub-groups of Autism Spectrum Disorders [2]. The terms ASD and PDD (Pervasive Developmental Disorders) are currently used interchangeably.

Children with a wide range of abilities may have an Autism Spectrum Disorder, and this may occur in conjunction with other disorders (for example, sensory disability, intellectual disabilities, Down's Syndrome, ADHD - Attention Deficit Hyperactivity Disorder –, as set out by the DSM-5 workgroup, or language difficulties).

- **Intellectual Disability**

“Intellectual disability”<sup>1</sup> refers to developmental difficulties causing cognitive disorders and affecting overall intellectual capacity and adaptive behaviour [4]. Adaptive behaviour is understood to be the set conceptual, social and practical skills which we learn in order to live our daily lives correctly. Limitations in these skills affect both daily life and the ability to adapt to changes and demands around us [4]. This disability appears before 18 years of age [4].

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<sup>1</sup> Formerly known as 'mental retardation', now considered a pejorative term.

## ■ The need for anticipation

While the ALARMS application is not an activity diary, one of the purposes for which it has been defined has a similar function: anticipating changes in activities and facilitating the transition between them. For this reason, ALARMS can be used in conjunction with the activities dairies used in managing autism.

Due to their difficulties in planning ahead (related to what are known as executive functioning difficulties), and also their issues with understanding and properly handling the concept of time, people with autism often have problems when it comes to changing activities.

To increase their understanding of these day to day aspects and prevent this type of problem, activity dairies are widely used, based on pictograms, photographs or objects. These aids are used to represent the different activities taking place during the day, and the person can consult what is about to happen at any time to keep up with this essential information.

In many cases, this greater degree of control over his/her life has been provided by the use of these dairies. Thanks to these aids, some people can better organize their daily lives and, for example, plan what they want to do in their free time. In the case of those whose capacities are not as fully developed, these dairies at least help them to know what others have planned for them on a daily basis, perhaps with certain key moments marked out for them to chose what to do (using choice panels) [5] (TEACCH Programme). It is believed that the *structuring of time* provided by these systems is a key element to preventing or reducing behavioral issues [5]. If it were not for these systems, some people would be destined to wander continuously from one activity to another, with no control or decision making of their own and, predictably, with a large number of “behavioral problems” associated to the changeover between activities.



As we have already indicated, the ALARMS application can be used to complement these diaries, setting alarms to anticipate transitions which may be more difficult for the person with autism to handle, where having advance warning can be essential. When the person is going to have to stop one of his/her favorite activities (such as listening to music) or must start an activity which he/she doesn't enjoy, it is especially important for him/her to be warned of the upcoming change and how much time is left until it takes place. Otherwise, the person with autism may suffer a situation of anxiety and this in all likelihood manifests itself through "behavior problems".

## ■ Remembering what to do

As we have been seeing, the root of many difficulties encountered by people with autism lies in their difficulties with understanding time: How long have I got to finish this task? For how long can I do this thing I like so much? How long until someone comes to collect me? These are questions which everyone asks themselves regularly – and the answers can only be provided by timepieces: watches, clocks, computer clocks, mobile phone clocks... all these share a series of codes which are commonly accepted and understood by most people.

However, many people with autism and/or intellectual disability have not been able to learn these codes (for example, numbers or how the hands work) and therefore suffer continuously from a lack of predictability, unable to know how long they can/have to continue doing something, or how long it is until somebody arrives.

On occasions, we can be rather demanding of people with autism, asking them to behave in a certain way or adopt a set of routines a specific times of the day. But how can they be

expected to remember that they are supposed to do something at a certain time, if they don't understand how a clock works?

Despite often having an excellent capacity for memorizing specific information, people with autism and intellectual disability tend to find other aspects of memory more challenging. Specifically, they tend to have problems with:

- Time-related memory [6,7]. This means that they have difficulty organizing memories distributed over time and when recalling information required discerning aspects of time.
- Memory relating to personal aspects [8]. This means that, given their difficulty in understanding their own mental state and that of others, people with autism can encounter difficulties when labeling emotionally significant events, or using different criteria in order to emotional designation, leading them to perceive and recall some important matters as being insignificant to others, and vice versa.

Consequently, when it comes to remembering that they are supposed to be doing something, people with autism may find it very difficult to get the moment right and understand why it is important for them to do what is asked of them. Quite often they behave differently to what is expected of them simply because they don't know exactly what is expected of them.

## ■ What is ALARMS?

ALARMS is an application developed as part of the Azahar project which supports the following process of presenting alerts and reminders for people with autism, using a computer or mobile device.

When preparing an ALARM for a person with autism, the tutor can configure the following aspects:

Table. Steps for Presenting an Alarm

	Step	Description	Character
1°	Pre-alarm warning	This is advance warning prior to an alarm which allows a certain amount of time to elapse between the first warning and the change of activity in question.	Optional
2°	Timer for the last few moments prior to the Alarm	This is a bar timer, similar to those used in TIC-TAC, showing the time remaining between the Pre-alarm warning and the alarm itself.	Optional
3°	Alarm	This is the actual alarm itself. It consists of an image, combined with sound (beep) and a voice message recorded by the tutor. All these aspects can be customized.	Compulsory
4°	Steps to follow: Instructions	A sequence of pictograms combined with sound, set up by the tutor to instruct the user what he/she has to do next.	Optional

## ■ Examples

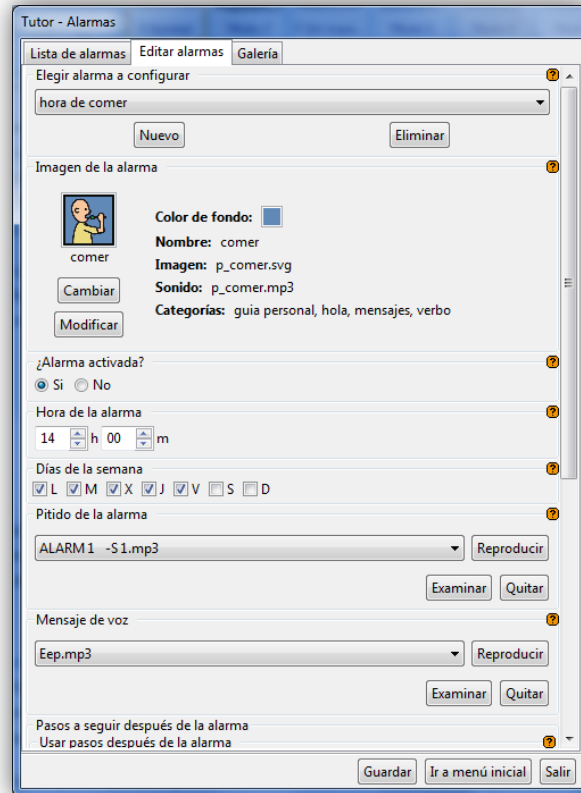
Here we illustrate the use of ALARMS with two different practical examples:

### ● Transition between activities

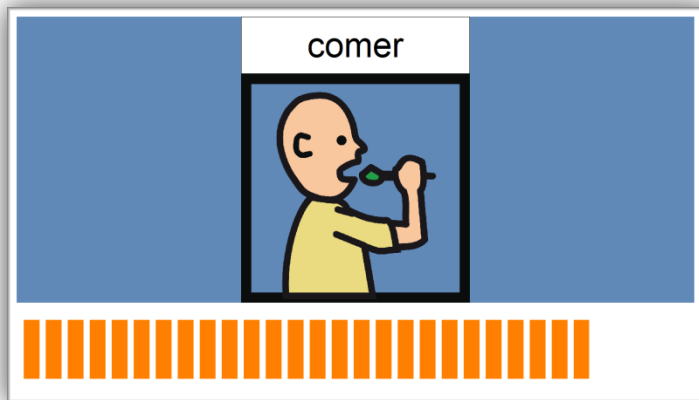
Maria finds the move from her leather craft activity to lunch in the canteen very difficult. She really enjoys lunch and she gets very agitated when her lunchtime is drawing near.

Her workshop at the Day Centre is fitted with an interactive whiteboard connected to a computer running Azahar. For some time, one of the carers working with her has been using TIC-TAC to indicate how much time remains. More recently, they have found that using ALARMS, this key moment could be programmed, meaning it was no longer necessary to access the computer and launch TIC-TAC each day.

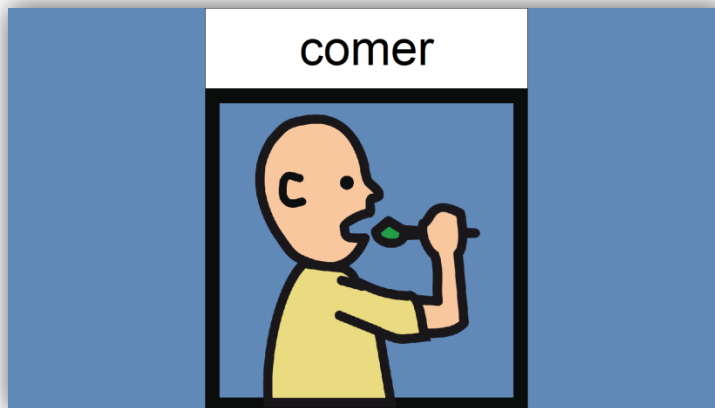
So, using the TUTOR application, ALARMS has been set up to sound at 2 pm, which is when lunch begins. But prior to this, a pre-alarm warning appears, with a timer, to indicate that there are 10 minutes to go before lunch.



In this way, every day that Maria is at the Day Centre, at 1:50 pm, she and her workshop peers see the following alert on the screen:



After the 10 minutes have elapsed, the pictogram fills the screen, accompanied by an alarm clock sound and the words "it's time for lunch, let's go to the canteen", recorded by the workshop supervisor.



In this case, no further “steps” or instructions are necessary once the alarm has sounded, as Maria is simply expected to go to the canteen, where she already has other support mechanisms in place, such as a picture-based menu.

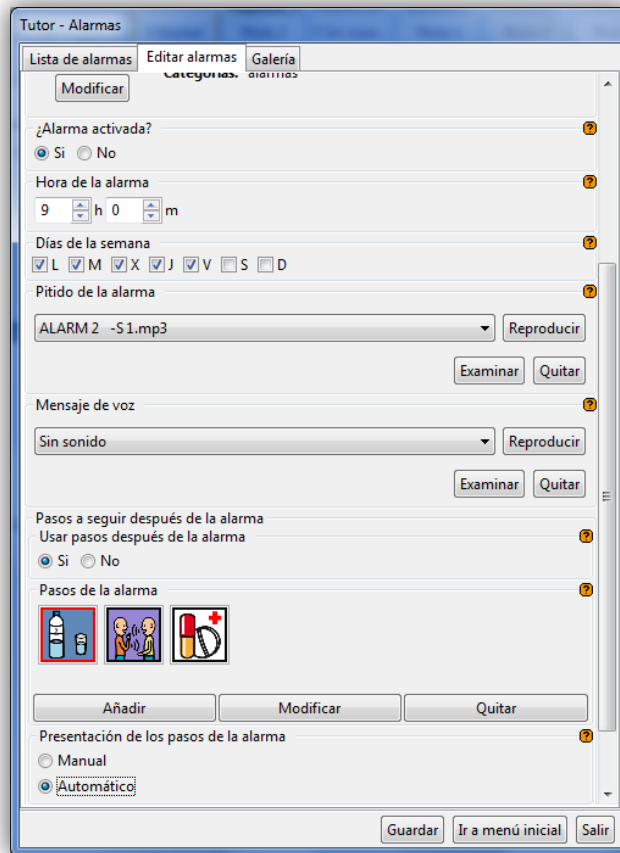
If it were necessary to use TIC-TAC timers to show Maria how much time she has to eat lunch, a different type of timer would be used (circular or egg timers) with a different background color and pictogram, in order to prevent her confusing her pre-lunch waiting period with the amount of time she has available to complete this task.

### **Reminders for taking medicine**

Pedro uses a digital tablet running Azahar, and he uses several of its applications such as MUSIC or TIC-TAC, which have proven very useful for him to listen to his own music and to know how much time he can spend doing certain activities.

Like a large number of people with autism and intellectual disability, Pedro has epilepsy. Luckily it has been possible to control his condition with a drug which he must take regularly at different times during the day. Although Pedro cannot administer his own medicine, as he does not understand the concept of measurements, ALARMS has proven to be a useful aid for this event. In particular, the application has been implemented to serve a dual purpose: helping him to anticipate the moment, and at the same time, acting as a reminder for those who have to give him the medication.

Pedro’s tutor has created a number of ALARMS for different times of the day when he needs to take his medication. One has been set up as follows:



So, when the time comes to take his pills, Pedro hears a beep on his digital tablet, and when he looks, he sees the following image:





After this initial image, by pressing on the screen, he sees a number of pictogram instructions with voice indications, telling him that he needs to: 1: get some water, 2: find his monitor, and 3: take the pill he is given.

This means that Pedro knows exactly what he has to do when it is time to take his medication, and he can collaborate as much as possible in this task.

## **Further recommendations**

In this guide we have highlighted the key aspects of the use of this application, which we will now attempt to complete as follows:

### **Initial use**

Just as with other Azahar applications, the use of ALARMS requires a learning process for both the user and the person who prepared the alarms and those who are with the user when the alarms sound. In this regard, it is important that the person is guided (physically if necessary) for the first few times the application is used, in order to handle the alarm correctly (pressing the screen when the alarm appears and completing the actions or steps indicated where applicable). After several times using the application with assistance, the person can gradually be left to respond as expected to the alarm without help from others, thus gaining more autonomy.

It is advisable for the different people who are to be involved in the process to meet in order to plan and receive the necessary training both in the use of the tool and for supporting the person as required.

### **Common uses for ALARMS**

The ALARMS application can be used to facilitate aspects relating to health and hygiene:

- as a reminder to use the bathroom a certain number of times each day
- for drinking a glass of water at certain times
- taking medicine
- brushing teeth after meals

Also providing information in advance:

- waking up
- transitions between activities
- morning reminders of the key event for that day (for example “today is swimming day” or “today you are going horse riding”)

The ‘steps’ which may be included in an ALARM can be used:

- to give instructions about what needs to be done, such as recalling mechanical routines (put on bathing suit and get swimming bag ready) or reminders for social habits (“say goodbye before leaving”).
- to prepare the person for an upcoming change, providing messages to help control anxiety such as “let’s stay calm, as nobody is going to hurt to at the doctor’s”, or for relaxation exercises, etc.

## ■ Difficulties

Just as with the other Azahar applications, the ALARMS application only runs on Windows based devices (Mobile, XP, Vista or Windows 7). This means it cannot be installed on all telephones or digital tablets.

When using ALARMS on a computer or tablet running Windows (XP, Vista or 7) some issues may occur if the *energy settings* are not configured correctly. For example, if the computer or device is in "Sleep" or "Hibernate" mode, or switched off when the time comes for the Alarm to sound, it will not be heard and therefore be of no purpose to the user.

## ■ Download and Installation

We have done our utmost to simplify the installation and preparation process for this tool. However, we are aware that for some professionals or family members who have less experience with modern technology, this process may seem complicated. In these cases it is highly recommended to obtain support from a friend or relative who is more familiar with the use of computers and other technological devices.

Detailed steps for installation can be found at: <http://www.proyectoazahar.org>

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## Credits



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