Guided Annotation: Daily Workflow

The Guided Annotation tool is designed to support the busy workdays in the IVF laboratory. The tool guides you from one variable to the next in an annotation strategy and automatically forwards the embryo images to estimated timings of events.
The estimated timings of most commonly used morphokinetic variables are based on an image recognition algorithm. The algorithm has been developed by using state-of-the-art Artificial Intelligence technologies to accurately detect timings of development events. In this way the tool supports consistent and efficient annotations. Your own validation completes the workflow.

Guided Annotation used in conjunction with KIDScore models provides the optimal support for your consistent embryo assessment process.

Main benefits

The Guided Annotation tool offers two main benefits:

- Faster annotation process
- Improved consistency of embryo assessment

These benefits are obtained by defining an annotation strategy and a desired level of automation.

Annotate page – the daily routine

The Guided Annotation tool integrates a redefined "Annotate" page.
This new "Annotate" page is activated by clicking the "Annotate" button in the navigation panel. The page is divided into two parts as illustrated in Figure 1.

On the left-hand side, the "Annotate" page displays an image of the selected embryo. The image is positioned above the division and blastomere activity charts.

The right-hand side of the page contains functions associated with the annotation process: List of identified embryos with their associated decision and annotation progress in percent (A), current annotation strategy and associated values (B), buttons and short-cuts for performing annotations (C) and strategy drop-down list (D).

If desired, disable the automatic estimation of events for single embryos (E). The automatic estimation will be re-enabled when you continue to the next well.

When you open the "Annotate" page for the first time, the division chart will be based on estimated timings. Also, estimated timings will be displayed in italics in the value column (B).

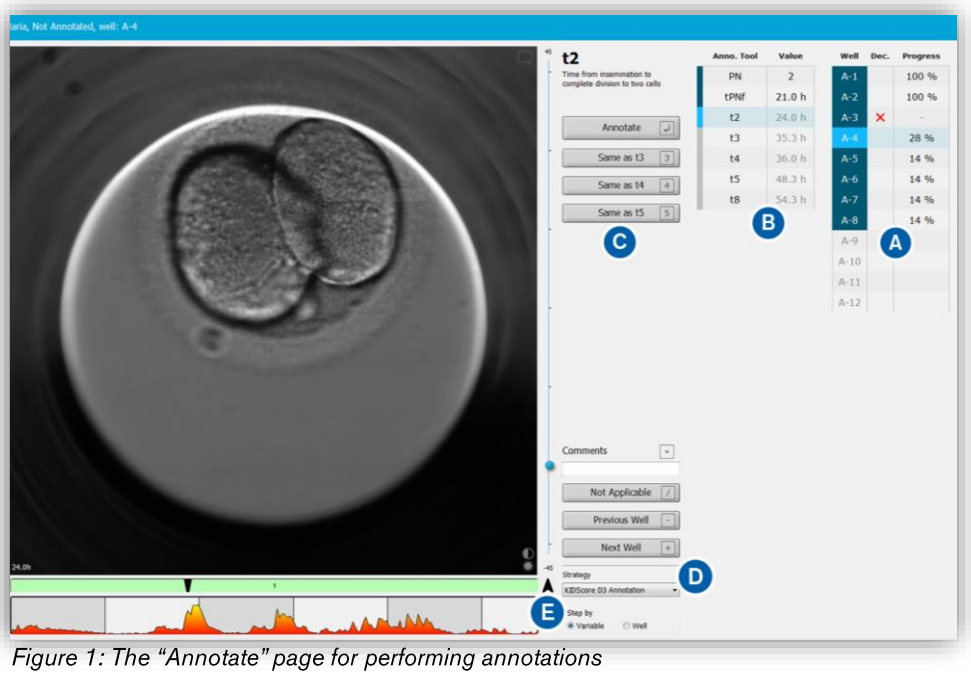

Figure 1: The "Annotate" page for performing annotations

Clinical workflow

The first variable in most strategies will be an assessment of whether or not two pronuclei can be detected in the embryo (this is the "PN" variable).

Vitrolife recommends to check the PN status in all wells on the day after insemination. This is most easily accomplished by indicating that you want to "Step by Well" 

on the "Annotate" page. In a clinical setting, all embryos that are not 2PN can be marked for avoidance: 

When the initial PN assessment has been completed, you may find it useful to "Step by Variable". With this setting the tool guides you through the annotation of all remaining variables, one embryo at a time, before automatically continuing to the next non-avoided embryo.

Variable estimates displayed in ***bold italics*** are on or above the confidence threshold as defined on the "Settings" page. If you have selected the "Automatic Forward" checkbox on the "Settings" page, such estimates are automatically confirmed. This increases the efficiency of the workflow. Variable estimates displayed in non-bold *italics* are below the confidence threshold and need your confirmation before progressing to the next variable in the strategy (figure 2).
The workflow specified above will ensure a consistent and efficient clinical workflow.

Final evaluation of the embryos

The division chart offers an initial indication of how the embryo development progresses. This chart is found on both the "View Slide" and on the "Compare & Select" pages once morphokinetic variables have been annotated.

Guided Annotation: synergy with the KIDScore models

The KIDScore decision support tools are designed to support embryo evaluation. Theses models require only few variables to be annotated – these are available as predefined annotation strategies in Guided Annotation.

Guided Annotation and KIDScore models can be used in conjunction, giving you the benefit of highly consistent annotations in your clinic´s embryo assessment process.

To compare embryo details side-by-side, comparison of the embryos, highlight a number of wells on the "Compare & Select" page and select the "Side-by-Side View" at the bottom of the page. This will bring you to a side-by-side view of the highlighted wells including a list of comments and up to four user-defined information details for each embryo (Figure 3).

Anno. Tool	Value
PN	*2*
t2	***25.5 h***
t3	***38.1 h***
t4	*39.6 h*
t5	***50.5 h***
tB	*110.4 h*
ICM	*A*
TE	*A*

Figure 2: Example of variable values estimated by the Guided Annotation tool.
*Estimates within the confidence threshold are depicted in **bold italic** (A) and those outside the threshold are depicted in italic (B).*

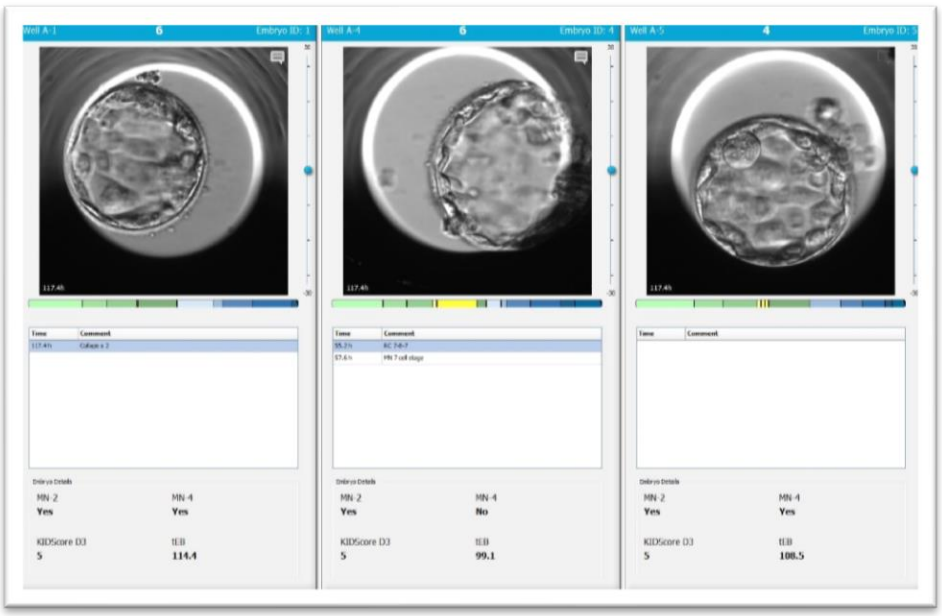

Figure 3: Side-by-side view of multiple wells showing lists of comments and user defined embryo details. You can access this view through the "Compare & Select" function.