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Synthesis: Thrombectomy alone vs. Thrombectomy plus thrombolysis

Synthesis

Qualitative

Quantitative

Manuscript

Risk of Bias

PRISMA

Back to AutoLit

Abstract

Mechanical thrombectomy (MT) is now the standard-of-care treatment for acute ischemic stroke (AIS) of the anterior circulation and may be performed irrespective of intravenous tissue plasminogen activator (IV-tPA) eligibility prior to the procedure. This study aims to understand better if tPA leads to higher rates of reperfusion and improves functional outcomes in AIS patients after MT and to simultaneously evaluate the functionality and efficiency of a novel semi-automated systematic review platform.

The Nested Knowledge AutoLit semi-automated systematic review platform was utilized to identify randomized control trials published between 2010 and 2021 reporting the use of mechanical thrombectomy and IV-tPA (MT+tPA) vs. MT alone for AIS treatment. The primary outcome was the rate of successful recanalization, defined as thrombolysis in cerebral infarction (TICI) scores  $\geq 2b$ .

Four studies with 1,633 patients, 816 in the MT+tPA arm and 817 in the MT arm, were included in the meta-analysis. In each study, patient populations consisted of only tPA-eligible patients and all imaging and clinical outcomes were adjudicated by an independent and blinded core laboratory. Compared to MT alone, patients treated with MT+tPA had higher odds of eTICI  $\geq 2b$  (OR = 1.34 [95% CI: 1.10; 1.63]).

Administering tPA prior to MT may improve the rates of recanalization compared to MT alone in tPA-eligible patients being treated for AIS, but a corresponding improvement in functional and safety outcomes was not present in this review.

Key Insights:

No significant difference in 90-day mRS 0-2, sICH, 90-day mortality or distal emboli

There were no statistically significant differences in the rates of 90-day mRS 0-2 (OR = 0.98 [95% CI: 0.77; 1.24]), 90-day mortality (OR = 0.94 [95% CI: 0.73; 1.21]), sICH (OR = 0.95 [95% CI: 0.71; 1.26]), or distal emboli (OR = 0.95 [95% CI: 0.71; 1.26]).

## 2. Explore Summary

In the top-middle of the page “Summary” is automatically selected:

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Quantitative Synthesis: Thrombectomy alone vs. Thrombectomy plus thrombolysis

Summary

Distribution

NMA

Fixed Effects

Random Effects

Intervention	Outcome			Outcome			Outcome		
	TICI 2b/3			mRS 0-2			Mortality		
	(n/N)	%	[CI]	(n/N)	%	[CI]	(n/N)	%	[CI]
Interventions	1334/1599	84.4%	[81.0%, 87.3%]	747/1633	48.2%	[42.1%, 54.5%]	276/1633	16.5%	[14.0%, 19.4%]
▶ Mechanical thrombectomy	648/796	82.8%	[77.3%, 87.1%]	376/817	49.2%	[39.2%, 59.3%]	142/817	16.7%	[12.7%, 21.6%]
▶ Mechanical thrombectomy plus IVT	686/803	85.9%	[81.7%, 89.2%]	371/816	47.5%	[38.5%, 56.6%]	134/816	16.1%	[12.6%, 20.2%]

### Default Summary View

In the Default View:

- In the left column, **Interventions** are displayed down to the second level (that is, the nodes below the Root Node selected as Interventions).
- In the other 3 columns, **Data Elements** are displayed, and the most commonly-reported Data Elements are shown by default. In the cells below, results are broken down into:
  - For **Dichotomous variables**, the event rate (n), total population (N), percentage (see *Random/Fixed Effects*), and a 95% Confidence Interval.
  - For **Continuous variables**, the mean/median, standard deviation (SD)/range/interquartile range (IQR), and a 95% Confidence Interval.
  - For **Categorical variables**, the event rate (n) for each category, as well as the total population (N) upon hovering.

Note: All Data Elements are classified as Baseline or Outcome during timepoint selection. The Data

Element classification is displayed above each column upon selection.

From this Default View, you can manipulate the Interventions, Data Elements, and even statistic type to drill down on findings.

## Random vs. Fixed Effects

- **Random/Fixed Effects:** Across all Quantitative Synthesis pages, estimates and percentages displayed by Default are actually Random Effects calculations. To toggle to Fixed Effects (that is, an estimate based on an assumption of [constancy or non-randomness](#)), use the toggle in the upper right of the table.

## Expand Interventions

Click on an Intervention of interest to expand down to see its children. This can be done recursively, meaning that if your top-level Interventions have multiple layers below them, each click will expand the next level down.

## View Individual Underlying Studies

If there are no levels below a given Intervention, clicking on it will display the underlying studies and their associated Data Elements.

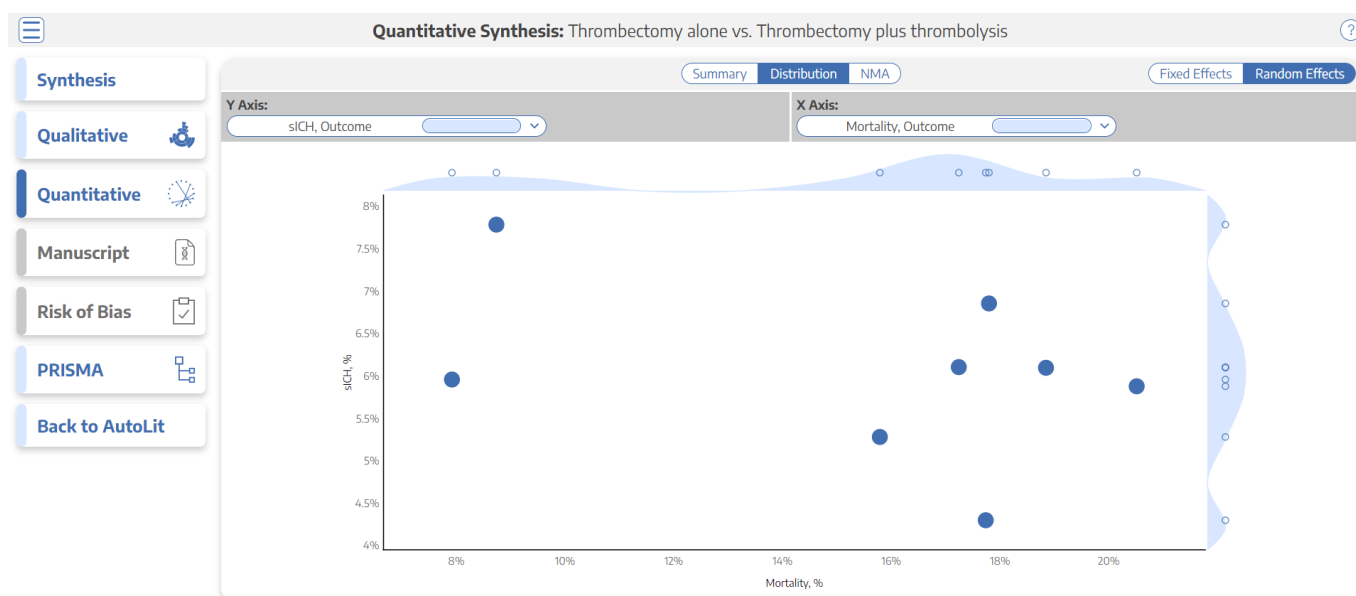
## Choose Data Elements / Columns

To choose different Data Elements, click on the drop-down at the top of a column, view the list of all Data Elements (with a bar that represents *data density*, or the rate at which it was reported across studies), and select the Data Element of interest.

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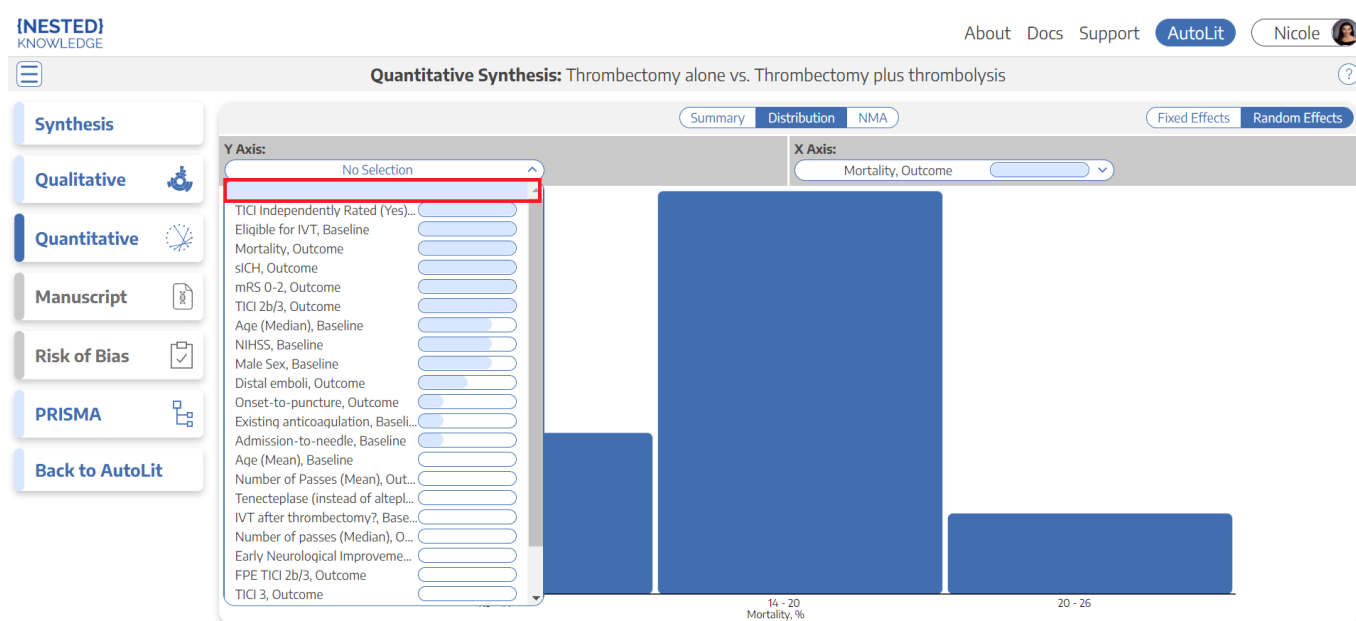
## 3. Explore Scatter Plot

In the top-middle of the page “Distribution” is highlighted. This page shows statistical relationships between Interventions and tags such as “slCH” and “Mortality” in a scatterplot formation.



In this page, select the X and Y axes to designate the Data Elements of interest. This will generate a chart that shows the distribution of studies based on their rate of each Data Element. Furthermore, hovering over any node in the Distribution page will show you the study the node represents, and clicking on it will open a study modal showing the abstract, data, tags, and search history of that study.

**Histogram view:** To view a histogram of findings for a single data element, go to the Y Axis selector, and click on the first option, which looks like a blank field. This will generate a histogram showing the distribution of findings across studies with respect to one, not two, data elements.



## 4. Explore NMA

To navigate to the Network Meta-analysis (NMA), in the top-middle of the page, click "NMA".

To explore the functions of NMA, see the [Explore NMA page](#).

## Calculation Methods for Quantitative Synthesis

To see how statistics are calculated for Quantitative Synthesis, including for the NMA, see [here](#).

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### Reorder or Hide Tags

Since the order of dropdown options reflects the order of tags in the tagging hierarchy, you may wish to reorder these tags. See instructions on [how to Reorder Tags](#).

If you wish to hide tags in Synthesis, [see instructions here](#). Tags will only be hidden in Synthesis and will still be present in AutoLit.

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Last update: **2023/03/13 19:38**