Playing with BMJ Rapid Recommendations in the MAGIC Evidence Ecosystem

The Digital and Trustworthy Evidence Ecosystem

Day 45: Completed systematic review
Synthesize evidence

Day 90: Published recommendation
Disseminate evidence to clinicians
Trustworthy guidelines

Day 90: Available for SDM
Disseminate evidence to patients
Enhancing the Evidence Ecosystem
Decision aids for the clinical encounter

Evaluate and improve practice
Recording practice & population-based data
EMR, Registries, Quality Indicators, Shared decisions

Day 90: Available at point of care
Implement evidence
Personalized decision support in the EMR

NEW EVIDENCE
Primary studies

Workshop EBHC Conference Taormina 2019
Per Olav Vandvik, on behalf of colleagues in the non-profit MAGIC Evidence Ecosystem Foundation
Objectives

1. To understand how MAGICapp works for clinicians and patients, with trustworthy recommendations, evidence summaries and decision aids, exemplified through the BMJ Rapid Recommendations project for practice-changing evidence.

2. To be introduced to the process of developing, publishing and dynamically updating a trustworthy recommendation from an existing systematic review, with the GRADE system and the MAGICapp.

1. To get hands-on experience with use of the MAGICapp in the creation and dynamic updating of a living guideline recommendation.
Plan for workshop

1. Where does MAGIC and BMJ Rapid Recommendations belong in the Evidence Ecosystem?

2. Playing with a published BMJ Rapid Recommendation in groups, exploring new publication formats in The BMJ and MAGICapp

3. Plenary discussion follows

4. Testing authoring and dynamic updating in MAGICapp (if time permits)

5. In a final plenary discussion feedback on user experience of the MAGICapp will be discussed
Creating, publishing and dynamically updating trustworthy recommendations, evidence summaries and decision aids in digitally structured formats

MAGIC app
Guideline authoring and publication platform

New evidence
Dynamic updating

PICO Individual studies Descriptive tables Evidence profiles
Recommendations Key information Rationale

Database
Structured and tagged content

Guideline panel Using MAGICapp

Decision aids
For patients and clinicians
Adaptation
National and local or EBM textbooks

Multilayered formats
For all devices

Integrated in the EMR

www.magicapp.org
Our vision:  
A Digital and Trustworthy Evidence Ecosystem  
to increase value and reduce waste in health care

**Synthesize evidence**  
Relevant, timely, reliable and living systematic reviews

**Produce evidence**  
Relevant and reliable primary research, real-world evidence and big data

**Produce guidance**  
Trustworthy HTA, guidelines and decision aids re-using same evidence and structured data

**Disseminate guidance to policy makers, clinicians and patients**  
Digital, multilayered and user friendly HTA-reports, guidelines and decision aids on all devices, plugged into portals, publications etc

**Tools and platforms**

**Coordination and support**

**Common Methodology**

**Digitally structured data**

**Culture for sharing and innovation**

**Global standards**

**Evaluate impact in practice**  
Quality improvement initiatives, population-based data in EHRs, dynamic registries, studies (e.g RCTs)

**Implement guidance and decision support**  
Personalized decision support in EHRs, pathways, registries, local protocols etc

11/13/2019
Some hurdles to overcome: Organizations fit for purpose?
How can we rapidly get potentially practice-changing evidence into practice?
Collaborative network approach, partnering with innovative medical journal?
The BMJ-RapidRecs project: methods and process

• Guideline panel, network of the right people
  ✓ Trustworthy guideline standards, GRADE
  ✓ Focus on conflict of interest, patient involvement….  
• Linked high quality systematic reviews
  ✓ effects, prognosis, values and preferences
  ✓ Separate teams, closely interacting with guideline panel

Rapid Recommendations process step by step (with target times)

Step 1: Monitor and identify potentially practice changing evidence

Step 2: Executive + chair triggers process and RapidRecs panel (day 7)

Step 3: Systematic reviews created by separate teams (day 45)

Step 4: RapidRecs created in MAGICapp and as synopsis paper (day 60)

Step 5: RapidRecs + reviews submitted for peer review (day 60)

Step 6: RapidRecs and reviews disseminated globally (day 90)
Potentially practice-changing evidence for Daniel?
Triggering our first BMJ- RapidRecs, published September 28 2016

- Daniel, 69 years old
- Heart failure, not feeling well..
- Severe aortic stenosis, all set up for open heart surgery in Norway
- Read newspaper, questions if he could have “TAVI”...
BMJ-RapidRecs for TAVI, let us have a look before you explore it together...

* All papers open access and for you to scrutinize, adapt and use for your purposes
Plenary discussion

• How does this way of displaying evidence and recommendations work for clinicians, you, people?

• How can we further improve MAGICapp?
How to develop and update an evidence summary and a trustworthy recommendation in MAGICapp
1. Formulate Clinical Questions
   - **PICO questions**
     - What is new? What do I need to look up?

2. Find Effect Estimates
   - Systematic Reviews
   - Randomized Controlled Trials
   - Observational Studies
   - Meta-analyses

3. Quality Assessment
   - How confident are you in your effect estimates?
   - For each outcome

4. Process it using the 4 factors
   - **B&H** (Benefit-Harm)
   - **QoE** (Quality of Evidence)
   - **V&P** (Variability and Patient Preferences)
   - **R** (Resource Issues)
   - What are the expected benefits and harms?
   - What are the overall confidence in these estimates?
   - What are patients' values and preferences?
   - Do they vary? Do you know?
   - Important societal values to consider?
   - Are there resource issues to consider?
   - For whom?

5. Recommendations
   - **Weak or Strong**
     - Most patients would want it, but not all.
     - Clear benefits with the suggested action
   - **Give a rationale**
     - To explain why the recommendations ended up in a particular way.
NEWS: Two new trials on TAVI published recently, We now need to update our living BMJ Rapid Recommendations

Updated SR (6 trials, 6478 patients)
Practice-changing moderate certainty evidence for key outcome:
Long-term aortic valve reintervention TAVI vs SAVR: **RR 2.2 (1.7-2.7)**

2 RCTs at low risk of bias
Improving patient care through guidelines, evidence summaries and decision aids that we can all trust, use and share

Recently published guidelines

- **Adjunctive corticosteroid therapy for adults hospitalized with community-acquired pneumonia**
  - Reed Siemienski - WikiRecs Group

- **Retningslinjer for antitrombotisk behandling og profylakse**
  - Per Olav Vendvik - Norsk Selskap for Trombose og Hemostase

- **Behandlingsretningslinjer for håndleddsbrudd hos voksne**

- **National klinisk retningslinje for analinkontinens hos voksne – konservativ behandling og udredning af nyopstået**

Sign in with Google

Or enter your credentials below

Email
workshop1@magicapp.org

Password

Remember Me

Forgot Password?

Sign In
Log in
www.magicapp.org

Group 2:
user: workshop2@magicapp.org
Pass: workshop2

Group 3:
user: workshop3@magicapp.org
Pass: workshop3

Group 4:
user: workshop4@magicapp.org
Pass: workshop4

Group 5:
user: workshop5@magicapp.org
Pass: workshop5
## Transfemoral Transcatheter aortic valve insertion (TAVI) vs Surgical aortic valve replacement (SAVR)

Patients 65-75 years with severe symptomatic aortic stenosis who are at low or intermediate perioperative risk

### 15 Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Study results and measurements</th>
<th>Absolute effect estimates</th>
<th>Certainty in effect estimates</th>
<th>Plain text summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mortality, age adjusted</strong></td>
<td>Hazard Ratio 0.79 (CI 95% 0.66 - 0.94) Based on data from 2576 patients in 3 studies Follow up: 2 years.</td>
<td>92 per 1000</td>
<td>Moderate</td>
<td>TAVI probably reduces the risk of death.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>73 per 1000</td>
<td>Due to serious imprecision</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difference: 19 fewer per 1000 (CI 95% 30 fewer - 5 fewer)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stroke (includes perioperative events)</strong></td>
<td>Relative risk 0.8 (CI 95% 0.63 - 1.01) Based on data from 2576 patients in 3 studies Follow up: 2 years.</td>
<td>70 per 1000</td>
<td>Moderate</td>
<td>TAVI probably reduces the risk of stroke.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>56 per 1000</td>
<td>Due to serious imprecision</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difference: 14 fewer per 1000 (CI 95% 1 more - 26 fewer)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aortic valve reintervention</strong></td>
<td>Relative risk 1.5 (CI 95% 1.2 - 1.8) Based on data from 3058 patients in 3 studies Follow up: 2 years.</td>
<td>3 per 1000</td>
<td>High</td>
<td>TAVI probably increases the risk of aortic valve reintervention.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 per 1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difference: 2 more per 1000 (CI 95% 1 more - 2 more)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aortic valve reintervention - long term</strong></td>
<td>Relative risk 1.5 (CI 95% 1.2 - 1.8) Based on data from 3058 patients in 3 studies Follow up: 2 years.</td>
<td>61 per 1000</td>
<td>High</td>
<td>TAVI may increase need for aortic reintervention due to structural valve deterioration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>92 per 1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difference: 31 more per 1000 (CI 95% 12 more - 49 more)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# TAVI versus SAVR for patients with severe symptomatic aortic stenosis at low to intermediate perioperative risk

<table>
<thead>
<tr>
<th>Population</th>
<th>Intervention</th>
<th>Comparator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients 65-75 years with severe symptomatic</td>
<td>Transfemoral Transcatheter aortic</td>
<td>Surgical aortic valve replacement (SAVR)</td>
</tr>
<tr>
<td>aortic stenosis who are at low or intermediate</td>
<td>valve insertion (TAVI)</td>
<td></td>
</tr>
<tr>
<td>perioperative risk</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under development</td>
</tr>
<tr>
<td>Mortality, age adjusted</td>
</tr>
<tr>
<td>Stroke (includes perioperative events)</td>
</tr>
<tr>
<td>Aortic valve reintervention</td>
</tr>
<tr>
<td>Aortic valve reintervention - long term</td>
</tr>
<tr>
<td>Permanent pacemaker insertion</td>
</tr>
<tr>
<td>Life threatening bleeding</td>
</tr>
<tr>
<td>Atrial fibrillation (includes transient</td>
</tr>
<tr>
<td>postoperative)</td>
</tr>
<tr>
<td>Moderate/severe heart failure symptoms (NYHA</td>
</tr>
<tr>
<td>(includes transient events)</td>
</tr>
<tr>
<td>something</td>
</tr>
<tr>
<td>Health-related quality of life</td>
</tr>
<tr>
<td>Length of index</td>
</tr>
<tr>
<td>hospitalization</td>
</tr>
<tr>
<td>Pain</td>
</tr>
<tr>
<td>Recovery time</td>
</tr>
</tbody>
</table>

[View More Details]
<table>
<thead>
<tr>
<th>Dichotomous Outcome</th>
<th>Outcome Timeframe</th>
<th>Absolute effect estimates</th>
<th>Certainty in effect estimates (Quality of evidence)</th>
<th>Plain text summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mortality, age adjusted</strong>&lt;br&gt;2 years</td>
<td></td>
<td>Hazard Ratio 0.79&lt;br&gt;(CI 95% 0.66 - 0.94)&lt;br&gt;Based on data from 2576 patients in 3 studies&lt;br&gt;Follow up: 2 years.</td>
<td>92&lt;br&gt;per 1000 73&lt;br&gt;per 1000&lt;br&gt;Difference: 19 fewer per 1000&lt;br&gt;(CI 95% 30 fewer - 5 fewer)</td>
<td>Moderate&lt;br&gt;Due to serious imprecision&lt;br&gt;TAVI probably reduces the risk of death.</td>
</tr>
<tr>
<td><strong>Stroke</strong>&lt;br&gt;(includes perioperative events)&lt;br&gt;2 years</td>
<td></td>
<td>Relative risk 0.8&lt;br&gt;(CI 95% 0.63 - 1.01)&lt;br&gt;Based on data from 2576 patients in 3 studies&lt;br&gt;Follow up: 2 years.</td>
<td>70&lt;br&gt;per 1000 56&lt;br&gt;per 1000&lt;br&gt;Difference: 14 fewer per 1000&lt;br&gt;(CI 95% 1 more - 26 fewer)</td>
<td>Moderate&lt;br&gt;Due to serious imprecision&lt;br&gt;TAVI probably reduces the risk of stroke.</td>
</tr>
<tr>
<td><strong>Aortic valve reintervention</strong>&lt;br&gt;2 years</td>
<td></td>
<td>Relative risk 3.25&lt;br&gt;(CI 95% 1.29 - 8.14)&lt;br&gt;Based on data from 3058 patients in 3 studies&lt;br&gt;Follow up: 2 years.</td>
<td>3&lt;br&gt;per 1000 10&lt;br&gt;per 1000&lt;br&gt;Difference: 7 more per 1000&lt;br&gt;(CI 95% 1 more - 21 more)</td>
<td>High&lt;br&gt;TAVI probably increases the risk of aortic valve reintervention.</td>
</tr>
<tr>
<td><strong>Aortic valve reintervention - long term</strong>&lt;br&gt;10 years</td>
<td></td>
<td>Relative risk 3.25&lt;br&gt;(CI 95% 1.29 - 8.14)&lt;br&gt;Based on data from 3058 patients in 3 studies&lt;br&gt;Follow up: 2 years.</td>
<td>61&lt;br&gt;per 1000 198&lt;br&gt;per 1000&lt;br&gt;Difference: 137 more per 1000&lt;br&gt;(CI 95% 18 more - 436 more)</td>
<td>High&lt;br&gt;TAVI may increase need for aortic reintervention due to structural valve deterioration</td>
</tr>
</tbody>
</table>
### Relative effect of intervention vs. comparator

<table>
<thead>
<tr>
<th>SOURCE OF EVIDENCE</th>
<th>DATA FROM INCLUDED STUDIES</th>
<th>RELATIVE EFFECT (FROM STUDIES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systematic review/ meta-</td>
<td>3,058 patients in 3 Studies.</td>
<td>Relative risk: 3.25 (CI 95%: 1.29 - 8.14)</td>
</tr>
<tr>
<td>Systematic review: Studies: 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Add and show evidence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Randomized controlled</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Follow up (in studies): 2 years

### Baseline risk (result of the outcome in the comparison group): SAVR

<table>
<thead>
<tr>
<th>SOURCE OF EVIDENCE</th>
<th>BASELINE RISK/ EFFECT WITH COMPARATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control arm of reference</td>
<td>3 per 1000</td>
</tr>
<tr>
<td>Studies: 0</td>
<td></td>
</tr>
<tr>
<td>Add and show evidence</td>
<td></td>
</tr>
</tbody>
</table>

### Expected difference and best estimate of effect with intervention: Transfemoral TAVI

<table>
<thead>
<tr>
<th>CALCULATED ESTIMATE WITH INTERVENTION</th>
<th>ESTIMATED ABSOLUTE DIFFERENCE OF INTERVENTION VS. COMPARATOR (CALCULATED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Difference: 7 more per 1000</td>
</tr>
<tr>
<td>per 100</td>
<td>CI 95%: (1 more - 21 more)</td>
</tr>
</tbody>
</table>
Patients aged 65 to < 75 years and eligible for transfemoral TAVI or SAVR

Weak recommendation

We suggest SAVR rather than TAVI

This recommendation considers benefits and harms of treatment alternatives with a particular weight on the uncertainty regarding the long-term durability of TAVI valves for those under 75. The age thresholds reflect the key issue, which is expected life span; clinicians need to also consider other factors such as comorbidity.

Aortic valve reintervention - long term 10 years

Relative risk 3.25 (CI 95% 1.29 - 8.14)
Based on data from 3,058 patients in 3 studies. (Randomized controlled) Follow up 2 years

<table>
<thead>
<tr>
<th>61 per 1000</th>
<th>198 per 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low</td>
<td>Due to inconsistency, indirectness and imprecision</td>
</tr>
<tr>
<td>TAVI may increase need for aortic reintervention due to structural valve deterioration</td>
<td></td>
</tr>
</tbody>
</table>

Difference: 137 more per 1000 (CI 95% 436 more - 18 more)
Patients aged 65 to < 75 years and eligible for transfemoral TAVI or SAVR

Weak recommendation

We suggest SAVR rather than TAVI

This recommendation considers benefits and harms of treatment alternatives with a particular weight on the uncertainty regarding the long-term durability of TAVI valves for those under 75. The age thresholds reflect the key issue, which is expected life span; clinicians need to also consider other factors such as comorbidity.

<table>
<thead>
<tr>
<th>Aortic valve reintervention</th>
<th>2 years</th>
<th>Relative risk 1.5 (CI 95% 1.2 - 1.8)</th>
<th>Based on data from 3058 patients in 3 studies</th>
<th>Follow up: 2 years.</th>
<th>3 per 1000</th>
<th>5 per 1000</th>
<th>High</th>
<th>TAVI probably increases the risk of aortic valve reintervention.</th>
</tr>
</thead>
</table>

| Aortic valve reintervention - long term | 10 years | Relative risk 1.5 (CI 95% 1.2 - 1.8) | Based on data from 3058 patients in 3 studies | Follow up: 2 years. | 61 per 1000 | 92 per 1000 | High | TAVI may increase need for aortic reintervention due to structural valve deterioration |
Patients aged 65 to < 75 years and eligible for TAVI

**Weak recommendation**

Benefits outweigh harms for the majority, but not for everyone.

**We suggest SAVR rather than TAVI**

This recommendation considers benefits and harms of treatment uncertainty regarding the long-term durability of TAVI valve issue, which is expected life span; clinicians need to also factor in patient's values and preferences.

**Benefits and harms**

Benefits of TAVI include reduced deaths, strokes, major bleeds, new onset atrial fibrillations and days in hospital over 2 year follow-up. Harms include increased heart failure, need for pacemaker insertions and aortic reinterventions in the short term over 2 year follow-up. Long term durability of TAVI valves is likely to be reduced compared to SAVR biological valves which suggests increased need for aortic valve reinterventions within the first 10 years.

**Quality of evidence**

For transfemoral TAVI versus SAVR, high certainty for decrease in acute kidney injury, bleeding, atrial fibrillation, and hospital length of stay; moderate certainty for decrease in mortality, stroke, recovery time and increase in short term (2 year) aortic valve reintervention; permanent pacemaker, and moderate/severe heart failure; low certainty for decrease in postoperative pain and very low certainty for increase in long term (10 year) aortic valve reintervention.

**Preference and values**

Patients are likely to place different value on benefits and harms associated with TAVI. Patients aged 75 or younger - with a life expectancy well beyond 10 years - are likely to place a particularly high value on avoiding need for a second aortic valve replacement and are likely to choose surgery. Patients who place a high value on avoiding initial open heart surgery and are willing to accept an increased risk for aortic valve reintervention are likely to choose TAVI. A systematic review of values and preferences provided limited evidence to inform our judgements. One study showed that patients have high risk willingness for mortality in exchange for perfect health (someone of equal age without aortic stenosis) [14].

**Resources and other considerations**

TAVI should be considered only in centres with sufficient expertise utilizing specialized TAVI teams consisting of interventional cardiologists, general cardiologists, cardiac surgeons, and appropriate nursing and adjunctive personnel. Cost-effectiveness of SAVR versus TAVI in low to intermediate risk patients remains uncertain in the absence of available cost-benefit analyses.
Plenary discussion

• Digital authoring of evidence summaries, recommendations and decision aids: Feasible or too big of a leap for you?

• How could MAGICapp work for you, in creating, publishing and updating evidence summaries for systematic reviews?

• Want to be part of the Evidence Ecosystem?
In summary

• MAGICapp allows creation, dissemination and dynamic updating of evidence summaries, recommendations and decision aids.

• Within an emerging evidence ecosystem, the BMJ-RapidRecs provide a model for rapidly responding to potentially practice-changing evidence through systematic reviews and trustworthy recommendations: Organizations fit for purpose?

• Authoring, publishing and updating of evidence summaries for systematic reviews an emerging opportunity: Will Cochrane and other review groups benefit from our services?