AF Identification & Treatment Pathways

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SHSCT
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Association between Afib and other CV outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Studies</th>
<th>Relative risk (95% CI)</th>
<th>Relative risk (95% CI)</th>
<th>I² (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripheral arterial disease</td>
<td>1</td>
<td>1.31 (1.19 to 1.45)</td>
<td>1.31 (1.19 to 1.45)</td>
<td>NA</td>
</tr>
<tr>
<td>All cause mortality</td>
<td>66</td>
<td>1.46 (1.39 to 1.53)</td>
<td>1.46 (1.39 to 1.53)</td>
<td>93</td>
</tr>
<tr>
<td>Ischaemic heart disease</td>
<td>16</td>
<td>1.61 (1.38 to 1.87)</td>
<td>1.61 (1.38 to 1.87)</td>
<td>86</td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td>3</td>
<td>1.64 (1.41 to 1.91)</td>
<td>1.64 (1.41 to 1.91)</td>
<td>50</td>
</tr>
<tr>
<td>Sudden cardiac death</td>
<td>7</td>
<td>1.88 (1.36 to 2.60)</td>
<td>1.88 (1.36 to 2.60)</td>
<td>78</td>
</tr>
<tr>
<td>Major cardiovascular events</td>
<td>9</td>
<td>1.96 (1.53 to 2.51)</td>
<td>1.96 (1.53 to 2.51)</td>
<td>98</td>
</tr>
<tr>
<td>Haemorrhagic stroke</td>
<td>3</td>
<td>2.00 (0.67 to 5.96)</td>
<td>2.00 (0.67 to 5.96)</td>
<td>73</td>
</tr>
<tr>
<td>Cardiovascular mortality</td>
<td>14</td>
<td>2.03 (1.79 to 2.30)</td>
<td>2.03 (1.79 to 2.30)</td>
<td>76</td>
</tr>
<tr>
<td>Ischaemic stroke</td>
<td>12</td>
<td>2.33 (1.84 to 2.94)</td>
<td>2.33 (1.84 to 2.94)</td>
<td>87</td>
</tr>
<tr>
<td>Stroke</td>
<td>38</td>
<td>2.42 (2.17 to 2.71)</td>
<td>2.42 (2.17 to 2.71)</td>
<td>96</td>
</tr>
<tr>
<td>Heart failure</td>
<td>6</td>
<td>4.99 (3.04 to 8.22)</td>
<td>4.99 (3.04 to 8.22)</td>
<td>93</td>
</tr>
</tbody>
</table>

Ayodele Odutayo et al. BMJ 2016;354:bmj.i4482
Classification

• New
  • < 48 hours

• Persistent
  • Non-self terminating
  • Cardiovertable

• Paroxysmal
  • variable duration
  • self terminating
  • able to terminate

• Permanent
  • Non-self terminating
  • Non-cardiovertable

SAME RISK OF STROKE
<table>
<thead>
<tr>
<th>CHADS₂-VASc Score</th>
<th>Stroke Risk %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>1/60</td>
</tr>
<tr>
<td>2</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>1/40</td>
</tr>
<tr>
<td>3</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>1/30</td>
</tr>
<tr>
<td>4</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>1/25</td>
</tr>
<tr>
<td>5</td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td>1/15</td>
</tr>
<tr>
<td>6</td>
<td>9.8</td>
</tr>
<tr>
<td></td>
<td>1/10</td>
</tr>
<tr>
<td>7</td>
<td>9.6</td>
</tr>
<tr>
<td></td>
<td>1/10</td>
</tr>
<tr>
<td>8</td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>15.2</td>
</tr>
</tbody>
</table>
Incidence AF 1998-2010

CPRD GOLD (UK primary care population, n=57,818) investigated the incidence of first AF among different age populations.

Overall, incidence plateaued during last decade, however increased in the older population.

Adapted from Lane DA et al., J Am Heart Ass. 2017
No treatment: CHA$_2$DS$_2$-VASc score 5

If 1000 people with AF and a CHA$_2$DS$_2$-VASc score of 5 take no anticoagulant, over 1 year on average:

- 916 people will not have an AF-related stroke (the green faces)
- 84 people will have an AF-related stroke (the red faces).

https://www.nice.org.uk/.../cg180-atrial-fibrillation-update-patient-decision-aid-24373...
Anticoagulant: CHA$_2$DS$_2$-VASc score 5

- Cost of CVA 12,000
- Cost of major bleed 1200
- Cost of anti-coag clinic 250

**VS**

- Cost of NOAC 800

If all 1000 people take an anticoagulant, over 1 year on average:
- 916 people will not have an AF-related stroke (the green faces), but would not have done anyway
- 57 people will be saved from having an AF-related stroke (the yellow faces)
- 27 people will still have an AF-related stroke (the red faces).

Why use them? Simple...

• Over VKAs NOACs have:
  • improved efficacy/safety ratio
  • no need routine coagulation monitoring
  • fewer food and drug interactions
But who to use them in?

<table>
<thead>
<tr>
<th>Condition</th>
<th>Eligibility for NOAC therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical prosthetic valve</td>
<td>Contraindicated</td>
</tr>
<tr>
<td>Moderate to severe mitral stenosis (usually of rheumatic origin)</td>
<td>Contraindicated</td>
</tr>
<tr>
<td>Mild to moderate other native valvular disease (e.g., mild-moderate aortic stenosis or regurgitation, degenerative mitral regurgitation etc.)</td>
<td>Included in NOAC trials</td>
</tr>
<tr>
<td>Severe aortic stenosis</td>
<td>Limited data (excluded in RE-LY)</td>
</tr>
<tr>
<td></td>
<td>Most will undergo intervention</td>
</tr>
<tr>
<td>Bioprosthesis valve (after &gt; 3 months post operatively)</td>
<td>Not advised if for rheumatic mitral stenosis</td>
</tr>
<tr>
<td></td>
<td>Acceptable if for degenerative mitral regurgitation or in the aortic position</td>
</tr>
<tr>
<td>Mitral valve repair (after &gt; 3 months post operatively)</td>
<td>Some patients included in some NOAC trials</td>
</tr>
<tr>
<td>PTAV and TAVI</td>
<td>No prospective data yet</td>
</tr>
<tr>
<td></td>
<td>May require combination with single or dual antiplatelet therapy</td>
</tr>
<tr>
<td>Hypertrophic cardiomyopathy</td>
<td>Few data, but patients may be eligible for NOACs</td>
</tr>
</tbody>
</table>

Hatched—limited data.
Switching over

From VKA to NOAC

- **Daily VKA Therapeutic INR**
  - **Stop**
  - **INR**
  - **INR**
  - **INR**
  - **INR**

- **INR ≤2**: start NOAC immediately
- **INR 2-2.5**: start NOAC immediately or next day
- **INR 2.5 - 3**: Re-check INR in 1-3 days
- **INR ≥3**: postpone NOAC

*Increased TE risk* → *Increased bleeding risk*
Figure 4 Use of non-vitamin K antagonist oral anticoagulants according to renal function. a $2 \times 110$ mg in patients at high risk of bleeding (per SmPC). b Other dose reduction criteria may apply (weight $\leq 60$ kg, concomitant potent P-Gp inhibitor therapy). c $2 \times 2.5$ mg only if at least two out of three fulfilled: age $\geq 80$ years, body weight $\leq 60$ kg, creatinine $\geq 1.5$ mg/dL (133 mmol/L). Orange arrows indicate cautionary use (dabigatran in moderate renal insufficiency, FXa inhibitors in severe renal insufficiency, edoxaban in ‘supranormal’ renal function); see text for details.
Missed or double dosing

• Missed =
  Take up to 50% interval time after missed dose (BID – 6 hours, OD, 12 hours)
  If beyond this skip the dose unless very high stroke risk

• Double =
  BID dosing miss the next dose
  OD dosing continue as usual
How to start and how to follow

Initiator of anticoagulant treatment:
- Establishes indication for anticoagulation
- Checks baseline blood works, incl. hemoglobin, renal and liver function, full coagulation panel
- Chooses anticoagulant and correct dose
- Decides on need for proton pump inhibitor
- Provides education and hands out anticoagulation card
- Organises follow-up (when, by whom, what?)
- Remains responsible coordinator for follow-up

Follow-up: GP; anticoagulant or AF clinic; initiator of therapy; ...
- Checks for thromboembolic- and bleeding events
- Assesses adherence (remaining pills, NOAC card, ...), re-enforces education
- Checks for side effects
- Assesses co-medications and over-the-counter drugs
- Assesses modifiable risk factors and takes every effort to minimize them
- Determines the need for blood sampling
- Assesses optimal NOAC and correct dosing

First FU: 1 month

+-/- 3 months
(1-6 months, interval depending on patient factors incl. renal function, age, comorbidities etc)

In case of problems: contacts initiator of treatment. Difficult decisions on anticoagulation should be taken by a multidisciplinary team.

Otherwise:
- Fills out anticoagulation card
- Reinforces key educational aspects
- Sets date/place for next follow-up

How do we optimize care for patients with AF?

Clinical pathway for atrial fibrillation

1 Targeted and opportunistic screening
2 Identification & assessment of atrial fibrillation
3 Initial management
4 Long-term management

Ensure an appropriate anticoagulant strategy

Provide patients and carers with management information (education) and long-term management plan/strategy
<table>
<thead>
<tr>
<th>Known AF</th>
<th>Detection</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
1. Known AF

This guy... Should not affect decision to anticoagulate
2. Detection of AF

Targeted and Opportunistic Screening

Targeted screening

Identify appropriate setting and cohort of people to assess
These may include, for example:
- Flu clinics
- Hypertension clinics
- Over-75 health checks (including housebound and nursing home patients)
- Health checks
- Sleep apnoea clinics
- Case-finding in Primary Care using an appropriate audit tool

Opportunistic screening

Setting and cohort not specifically identified
Opportunistic screening may occur in any setting, for example:
- Walk-in Centres
- A&E
- Community pharmacy
- Health events

If AF suspected, refer to initial assessment
2. Detection: Cost Effective?

The ICER of an AF screening program
— expressed as cost per QALY gained.

\[
\text{Cost}_{\text{AF Screening}} - \text{Cost}_{\text{No Screening}} = \frac{\text{QALY}_{\text{AF Screening}} - \text{QALY}_{\text{No Screening}}}{\text{Cost}_{\text{AF Screening}} - \text{Cost}_{\text{No Screening}}}
\]

The threshold of £20,000-£30,000 that is suggested by NICE to be the limit for treatments to be cost-effective.
Why is AF-screening considered highly cost-effective?

- Stroke is a severe event associated with high;
  - Cost
  - Morbidity
  - Mortality
- Approximately 12 – 24% of all strokes are due to unknown AF*
- The stroke risk can be effectively reduced through oral anticoagulation treatment
- Most screening methods are relatively inexpensive

Results of the simulation model screening 75 year olds

Per 1000 individuals:
- 8 fewer stroke
- 11 won life-years
- 12 gained QALYs
- Inc. cost of €50 012

€4313 per gained QALY

3. Prevention

**Primary prevention of AF**
- Maintaining a heart-healthy lifestyle
- Treatment of other underlying conditions that can contribute to the onset of AF:
  - Sleep apnoea
  - Thyroid disease
  - Diabetes
  - Obesity
  - Chronic lung disease
  - Other heart conditions

**Secondary prevention**
(to reduce risks of complications associated with AF)
- Anticoagulation
  (in accordance with CHA₂DS₂ -VASc)
- Regular physical activity
- Heart-healthy diet, low in saturated fats, trans fats, and cholesterol
- Management of high blood pressure
- Avoiding excessive amounts of alcohol and caffeine
- Smoking cessation
- Cholesterol control and maintaining a healthy weight
“Perfect, Detect, Prevent"
How well do we do each in SHSCT?

• 1 Known AF – Perfect
  • Practice Dependent

• 2. Detection AF – Detect
  • Practice Dependent

• 3. Prevention of AF - Prevent
  • Practice Dependent

• In Future: Active collaboration
  • Cardiologist Champion, ICP, Federation Pharmacists – Perfect Perfection
  • Next goal Detect and Prevent
Known AF:
- Clear Tx Guidelines
- NOAC Safe & Effective

AF Detection:
- Ongoing Struggle

Questions?
Additional slides
Follow up & Checklist

• regular - preferably after 1/12 initially and at least q 3/12 thereafter
• 1. Adherence
• 2. Thromboembolism
• 3. Bleeding
• 4. Side effects
• 5. Co-medications (incl OTC)
• 6. Bloods – yearly most, 6/12 frail or >65, x/12 for CKD (CrCl/10)
• 7. Minimize bleeding risk (NSAID, C2H5OH, ASA)
• 8. Appropriate NOAC and at correct dose
**Table 3**  Effect of drug–drug interactions and clinical factors on NOAC plasma levels (‘area under the curve’)

<table>
<thead>
<tr>
<th></th>
<th>Via</th>
<th>Dabigatran etexilate</th>
<th>Apixaban</th>
<th>Edoxaban</th>
<th>Rivaroxaban</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-gp substrate</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>CYP3A4 substrate</td>
<td>No</td>
<td>Yes (≈25%)</td>
<td>No (&lt;4%)</td>
<td>Yes (≈18%)</td>
<td></td>
</tr>
</tbody>
</table>

**Antiarrhythmic drugs**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Via</th>
<th>Dabigatran etexilate</th>
<th>Apixaban</th>
<th>Edoxaban</th>
<th>Rivaroxaban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amiodarone</td>
<td>moderate P-gp competition</td>
<td>+12 to 60%&lt;sup&gt;SNPC&lt;/sup&gt;</td>
<td>No PK data&lt;sup&gt;a&lt;/sup&gt;</td>
<td>+40%&lt;sup&gt;132–134&lt;/sup&gt;</td>
<td>Minor effect&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Digoxin</td>
<td>P-gp competition</td>
<td>No effect&lt;sup&gt;SNPC&lt;/sup&gt;</td>
<td>No effect</td>
<td>No effect</td>
<td>No effect&lt;sup&gt;SNPC&lt;/sup&gt;</td>
</tr>
<tr>
<td>Diltiazem</td>
<td>P-gp competition and weak CYP3A4 inhibition</td>
<td>No effect&lt;sup&gt;SNPC&lt;/sup&gt;</td>
<td>+40%&lt;sup&gt;136&lt;/sup&gt;</td>
<td>No data yet</td>
<td>No effect</td>
</tr>
<tr>
<td>Dronedarone</td>
<td>P-gp competition and CYP3A4 inhibition</td>
<td>+70 to 100% (US: 2 × 75 mg if CrCl 30–50 mL/min</td>
<td>No PK or PD data: caution</td>
<td>+85%&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Moderate effect, should be avoided</td>
</tr>
<tr>
<td>Quinidine</td>
<td>P-gp competition</td>
<td>+53%&lt;sup&gt;SNPC&lt;/sup&gt;</td>
<td>No data yet</td>
<td>+77%&lt;sup&gt;137&lt;/sup&gt; (no dose reduction required by label)</td>
<td>Extent of increase unknown</td>
</tr>
<tr>
<td>Verapamil</td>
<td>P-gp competition (and weak CYP3A4 inhibition)</td>
<td>+12 to 180%&lt;sup&gt;SNPC&lt;/sup&gt; (if taken simultaneously)</td>
<td>No PK data</td>
<td>+53%&lt;sup&gt;(SR)&lt;/sup&gt;&lt;sup&gt;137,147&lt;/sup&gt; (no dose reduction required by label)</td>
<td>No effect</td>
</tr>
</tbody>
</table>
But who to use them in?

- “Non-Valvular AF”
- Not for mechanical prostheses
- Not for moderate-severe mitral stenosis
- But can be used for other valvular lesions
- Confusing term
- Eliminated from ESC 2016 AF guidelines
But who to use them in?

• Non-Valvular AF
• Prevention of thromboembolism in AF, many with concomitant valve issue
• Novel classification – EHRA Evaluated Heart valves Rheumatic or Artificial

**Exception** = AF in the presence of a mitral bioprosthesis for rheumatic MS. Although mitral valve flow is normalized, atria usually remain large and severely diseased. VKA may be the preferred option over NOACs, but more data are needed

• Type 2 = grey area, some included in trials, not many
• Considered since long-term systemic anti-coagulation not required

That included higher rates of death or a first thromboembolic event (11.4% vs 8.8%), all-cause death (6.8% vs 3.3%), and primary bleeding (4.2% vs 2.4%).
What was the GALILEO Trial?

- Anticoagulation strategy
  - rivaroxaban 10 mg OD plus aspirin 75 to 100 mg x 90 days, followed by rivaroxaban alone
- VS antiplatelet strategy
  - clopidogrel 75 mg plus aspirin 75 to 100 mg OD x 90 days followed by aspirin alone
- Patients with atrial fibrillation were excluded

ClinicalTrials.gov Identifier: NCT02833948
But who to use them in? HCM

• HCM with AF = high rate thromboembolism
• Limited data NOACs in HCM
• Unlike mechanical valves/MS, no mechanistic reason why inferior
• Contrary – HCM similar to HFpEF with AF, for which no indication NOAC inferior to VKA
• Superior in high risk subgroups (eg high CHADS2VASC) so HCM patients may be eligible

G Magnani et al Eur J Heart Fail 2016;18:1153-1161
**Figure 5** Management of bleeding in patients taking non-vitamin K antagonist oral anticoagulants.
### Table 10  Possible measures to take in case of bleeding

<table>
<thead>
<tr>
<th>Non life-threatening major bleeding</th>
<th>FXa inhibitors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct thrombin inhibitors</strong></td>
<td><strong>FXa inhibitors</strong></td>
</tr>
<tr>
<td>(dabigatran)</td>
<td>(apixaban, edoxaban, rivaroxaban)</td>
</tr>
<tr>
<td>• Inquire about last intake + dosing regimen</td>
<td></td>
</tr>
<tr>
<td>• Local haemostatic measures</td>
<td></td>
</tr>
<tr>
<td>• Fluid replacement</td>
<td></td>
</tr>
<tr>
<td>• RBC substitution, if necessary</td>
<td></td>
</tr>
<tr>
<td>• Platelet substitution (in case of thrombocytopenia ≤60 × 10^9/L or thrombopathy)</td>
<td></td>
</tr>
<tr>
<td>• Fresh frozen plasma not as reversal agent (may be considered as plasma expander)</td>
<td></td>
</tr>
<tr>
<td>• Tranexamic acid can be considered as adjuvant (1 g i.v., repeat every 6 h, if necessary)</td>
<td></td>
</tr>
<tr>
<td>• Desmopressin can be considered in special cases such as coagulopathy or thrombopathy; 0.3 μg/kg i.v. infusion (max dose 20 μg)</td>
<td></td>
</tr>
<tr>
<td>• Estimate normalization of plasma levels:</td>
<td></td>
</tr>
<tr>
<td>• Normal renal function: 12–24 h</td>
<td></td>
</tr>
<tr>
<td>• CrCl 50–80 mL/min: 24–36 h</td>
<td></td>
</tr>
<tr>
<td>• CrCl 30–50 mL/min: 36–48 h</td>
<td></td>
</tr>
<tr>
<td>• CrCl &lt;30 mL/min: ≥48 h</td>
<td></td>
</tr>
<tr>
<td>• Maintain diuresis</td>
<td></td>
</tr>
<tr>
<td>• Consideridarucizumab (see below)</td>
<td></td>
</tr>
<tr>
<td>• Normalization of plasma levels: 12–24 h</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Life-threatening bleeding</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• All of the above</td>
<td></td>
</tr>
<tr>
<td>• Direct reversal: idarucizumab 5 g i.v. in two doses a 2.5 g i.v. no more than 15 min apart</td>
<td></td>
</tr>
<tr>
<td>• Prothrombin complex concentrate (PCC) 50 U/kg (with additional 25 U/kg if clinically needed)</td>
<td></td>
</tr>
<tr>
<td>• Activated PCC 50 U/kg; max 200 U/kg/day): no strong data about additional benefit over PCC. Can be considered before PCC, if available</td>
<td></td>
</tr>
<tr>
<td>• All of the above</td>
<td></td>
</tr>
<tr>
<td>• Direct reversal Andexanet alpha (if available)^4</td>
<td></td>
</tr>
<tr>
<td>• Bolus over 15–30 min, followed by 2-h infusion</td>
<td></td>
</tr>
<tr>
<td>• Rivaroxaban (last intake &gt;7 h before) or apixaban: 400 mg bolus, 480 mg infusion @ 4 mg/min</td>
<td></td>
</tr>
<tr>
<td>• Rivaroxaban (last intake &lt;7 h before or unknown) or enoxaparin or edoxaban: 800 mg bolus, 960 mg infusion @ 8 mg/min</td>
<td></td>
</tr>
</tbody>
</table>

^4 Awaiting further studies and advice from the prescribing insurance companies.
Stopping peri-procedure

• ¼ need temporary cessation within 2 years
• Few prospective data (await PAUSE trial results NCT02228798)
• Device implant
  uninterrupted VKA preferable
  BRUISE-CONTROL2 for NOAC – consider same as low bleeding risk, last dose morning on day before procedure.
• AF ablation = special considerations
  uninterrupted VKA anti-coagulation recommended
  Corroborated by RE-CIRCUIT (dab) and VENTURE-AF (riv). Ongoing AXAFA-AFNET (apix) and ELIMINATE-AF (edox)
### Table 11  Timing of last non-vitamin K antagonist oral anticoagulant intake before start of an elective intervention

<table>
<thead>
<tr>
<th></th>
<th>Dabigatran</th>
<th>Apixaban – Edoxaban – Rivaroxaban</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No important bleeding risk and/or adequate local haemostasis possible: perform at trough level (i.e. 12 h or 24 h after last intake)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Low risk</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CrCl ≥80 mL/min</td>
<td>≥24 h</td>
<td>&gt;24 h</td>
</tr>
<tr>
<td>CrCl 50–79 mL/min</td>
<td>≥36 h</td>
<td>&gt;72 h</td>
</tr>
<tr>
<td>CrCl 30–49 mL/min</td>
<td>≥48 h</td>
<td>&gt;96 h</td>
</tr>
<tr>
<td>CrCl 15–29 mL/min</td>
<td>Not indicated</td>
<td>Not indicated</td>
</tr>
<tr>
<td>CrCl &lt;15 mL/min</td>
<td>No official indication for use</td>
<td></td>
</tr>
<tr>
<td><strong>High risk</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No bridging with LMWH/UFH</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resume full dose of NOAC ≥24 h post-low bleeding risk interventions and 48 (–72) h post-high-bleeding risk interventions (see also Figure 8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patients undergoing a planned intervention should receive a written note indicating the anticipated date and time of their intervention, and the date and time of the last intake of their NOAC (and any other medication)</td>
<td></td>
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</tbody>
</table>

Low risk: with a low frequency of bleeding and/or minor impact of a bleeding; high risk: with a high frequency of bleeding and/or important clinical impact. See also Table 12. CrCl, creatinine clearance; LMWH, low molecular weight heparin; UFH, unfractionated heparin.
AF and CAD

• Common
• Complex
• Dual vs Triple therapy
• Combination of at least 1 antiplatelet + NOAC recommended for up to 12 months after ACS event and/or PCI according to the most recent ESC guidelines
• Meta-analysis combining WOEST, PIONEER AF-PCI, and RE-DUAL PCI suggests that the likelihood of an excess of thromboembolic events during dual therapy vs. triple therapy is low
• 2 ongoing trials, AUGUSTUS (NCT02415400) and ENTRUST-AF PCI (NCT02866175) - ?ever any need for triple therapy
Post ACS/PCI

• Pioneer data
• Dual vs triple (lower doses...) rivaroxaban
• Dual reduced bleeding without increasing thromboembolic risk (underpowered for efficacy)
• Then to rivaroxaban alone

• RE-DUAL
• Dabigitran 2 doses dual vs triple
**Figure 10** Acute management of elective percutaneous coronary intervention or acute coronary syndrome in atrial fibrillation patients treated with non-vitamin K antagonist oral anticoagulant.
Figure 12 Cardioversion work-flow in atrial fibrillation patients treated with NOACs, depending on the duration of the arrhythmia and prior anticoagulation. TOE, transoesophageal echocardiography.