A shareable clinical pathway for Anemia Management

Accelerating Clinical Quality

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A shareable clinical pathway is a visual decision model that is both human readable and machine automatable. Such a standardized workflow can improve the efficiency and quality of healthcare processes. We will demonstrate this by presenting models for the diagnosis and management of anemia.
Our Objective

Promote the modeling of Clinical Guidelines using open standards to:

- Disambiguate Guidelines creation and interpretation
- Inform care coordination workflows

so that:

- Clinical Knowledge is delivered at the point of care
- A single visual Knowledge Artefact is created for clinicians and for automation
Established to foster the sharing and promulgation of best-practices around modeling and sharing:

• clinical pathways,
• clinical guidelines, and
• other healthcare knowledge
Introduction to BPM+

Open standards for machine interpretable **models** based on unambiguous graphical **notations** visual languages (**MN**)
Healthcare specific standards

FHIR®
Automate healthcare data sharing and improve patient care

CDS Hooks®
A service that is invoked by the EHR via a Hook, evaluates its own logic using FHIR data and returns decision support via Cards

www.HL7.org
International Open Standards Used
Anemia is a common, multifactorial and complex condition in older people. In many, it is poorly assessed or not investigated, and there are currently no defined national guidelines on management pathways.

- Royal Society of Medicine
Clinical Scenario

- 57 year old female, post-menopausal
- History of chronic “arthritis”
- Mild deterioration in renal function
- On 6 chronic medications
- Negative stool guiac
- Hemoglobin 9.1 g/dL
- MCV 80 femtoliters
Problems faced by clinicians

- NO TIME
- NO REIMBURSEMENT
- NO OBVIOUS ANSWER AMONGST MANY POSSIBILITIES
# Problem areas

- Conditions with iron malabsorption like celiac disease
- Anemia of chronic disease
- Drugs
- Hypoplastic bone marrow, NOS
- Myelodysplasia
- Non-sickling hemoglobinopathy
- Hormonal disorders
Management of Anemia

Establish diagnosis

Narrow list of causes

Identify cause(s)

Treat

Monitor for response

Adjust diagnosis and treatment plans
Establish Diagnosis and Initial Triage
Decision Model for Triage
### Decision table reducing the search space

<table>
<thead>
<tr>
<th>Input 1</th>
<th>Input 2</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macrocytic</td>
<td>Normal</td>
<td>&quot;Heterozygous thalassemia&quot;</td>
</tr>
<tr>
<td>Macrocytic</td>
<td>Increased</td>
<td>&quot;Iron deficiency, sickle-beta thalassemia, H, red cell aplasia&quot;</td>
</tr>
<tr>
<td>Normocytic</td>
<td>Normal</td>
<td>&quot;Anemia of chronic disease, AS or AC, transfusion, hereditary spheredosis&quot;</td>
</tr>
<tr>
<td>Normocytic</td>
<td>Increased</td>
<td>&quot;Mixed anemia, early iron deficiency, hemoglobinopathies, anemia, myelofibrosis&quot;</td>
</tr>
<tr>
<td>Macrocytic</td>
<td>Normal</td>
<td>&quot;Aplastic anemia&quot;</td>
</tr>
<tr>
<td>Macrocytic</td>
<td>Increased</td>
<td>&quot;Folate or vitamin B12 deficiency, anemia, cold agglutinins&quot;</td>
</tr>
</tbody>
</table>
Refining the Diagnosis - Microcytic Anemia
Iron Replacement Therapy
Demo
Any questions?

THANKS!