NICE National Institute for Health and Care Excellence

Putting NICE guidance into practice

Resource impact report:

High-sensitivity troponin tests for the early rule out of NSTEMI (DG40)

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Summary

NICE has recommended high-sensitivity troponin tests for the early rule out of non-ST-segment-elevation myocardial infarction (NSTEMI).

We estimate that around:

- 1,600 people per 100,000 population of England with chest pains are eligible for testing with high-sensitivity troponins tests each year
- 1,600 people per 100,000 population of England will have high-sensitivity troponin testing from 2022/23 onwards once uptake has reached 100%.
- Around 70 fewer people per 100,000 will be admitted to hospital

The estimated annual saving of implementing this guidance per 100,000 population of England based on the uptake in the resource impact assumptions is shown in table 1.

Table 1 Estimated annual saving of implementing the guidance per 100,000 population of England

	Current practice	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
Population having high-sensitivity troponin tests each year	**1,515**	**1,534**	**1,580**	**1,608**	**1,608**	**1,608**
Resource impact – test cash saving **(providers)** (£000s)	0	0.0	-0.1	-0.1	-0.1	-0.1
Resource impact – admission cash savings **(commissioners)** (£000s)	0	-5.0	-17.4	-24.8	-24.8	-24.8
Total saving per 100,000 population of England (£000s)	**0**	**-5.0**	**-17.5**	**-24.9**	**-24.9**	**-24.9**

This report is supported by a resource impact template which may be used to calculate the resource impact of implementing the guidance by amending the variables.

Cardiological services for patients with NSTEMI are commissioned by clinical commissioning groups. Providers are NHS hospital trusts.

1 High-sensitivity troponin tests for the early rule out of NSTEMI

1.1 NICE has recommended high-sensitivity troponin tests for the early rule out of NSTEMI.

1.2 Cardiac troponin I and cardiac troponin T are biological markers of cardiac muscle death (cardiomyocyte necrosis). They are released into the circulation when damage to cardiac muscle has occurred. The optimum sensitivity of older (non-high-sensitivity) troponin assays for acute myocardial infarction occurs 10–12 hours after the onset of symptoms.

1.3 For many people, this results in the need for hospital admission and observation while serial troponin testing is carried out. To overcome this, high-sensitivity troponin assays have been developed. These can detect lower levels of troponin in the blood earlier than older standard assays, leading to improved early detection of acute myocardial infarction.

1.4 Using these high-sensitivity assays enables earlier detection of changes in troponin levels. This allows NSTEMI to be ruled out within 4 hours without the need for a hospital admission if test results are available within 3 hours of presentation to the emergency department or chest pain units. High-sensitivity assays are currently used in most hospitals.

2 Resource impact of the guidance

We estimate that around:

- 1,600 people per 100,000 population of England with chest pains are eligible for testing with high-sensitivity troponins tests each year

- 1,600 people per 100,000 population of England will have high-sensitivity troponin testing from 2022/23 onwards once uptake has reached 100%.

2.1 The current and future uptake of testing is based on the number of people having electrocardiograms (ECGs) and expert clinical opinion. These are shown in the resource impact template.

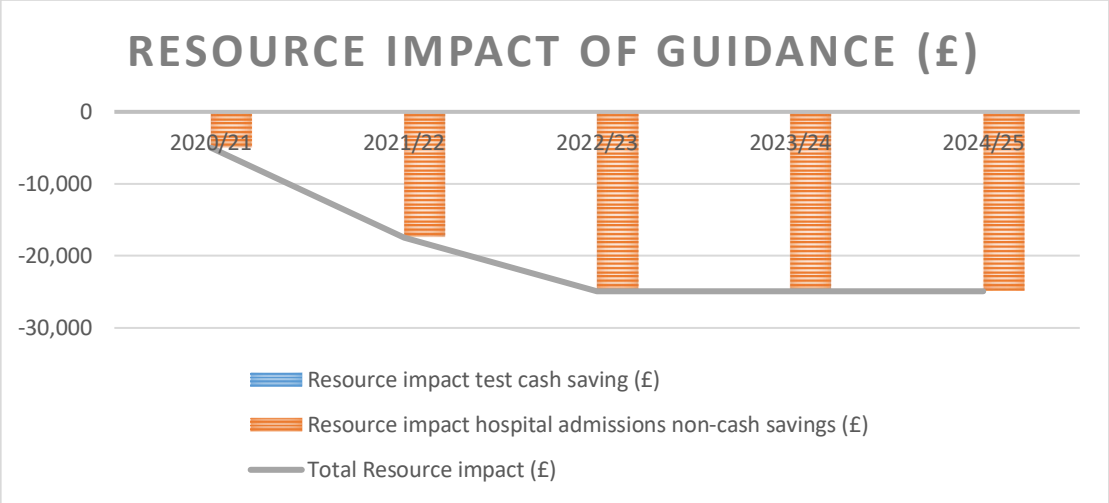
2.2 According to data from UK National External Quality Assessment Service (UK NEQAS) high-sensitivity troponin testing is widely available, but not in all areas. Where high-sensitivity troponin testing is not currently available, organisations should assess the impact locally.

2.3 The estimated annual saving of implementing this guidance for per 100,000 population of England, based on the uptake in the resource impact assumptions is shown in table 2. The savings from year 2022/23 once steady state is reached is equivalent to around £13.9 million for England. The majority of this saving is attributable to commissioners, arising from the reduction in admissions.

Table 2 Estimated annual saving of implementing the guidance per 100,000 population of England

	Current practice	2020/21	2021/22	2022/23	2023/24	2024/25
Population having high-sensitivity troponin tests each year	1,515	1,534	1,580	1,608	1,608	1,608
Resource impact – test cash savings **(providers)** (£000s)	0	0.0	0.1	0.1	0.1	0.1
Resource impact – admission cash savings **(commissioners)** (£000s)	0	-5.0	-17.4	-24.8	-24.8	-24.8
Total saving per 100,000 population of England (£000s)	**0**	**-5.0**	**-17.4**	**-24.9**	**-24.9**	**-24.9**

Figure 1 Resource impact for high-sensitivity troponin tests



2.4 This report is supported by a resource impact template which may be used to calculate the resource impact of implementing the guidance by amending the variables.

Savings and benefits

2.5 Increased use of highly sensitive testing should reduce the number of people admitted to hospital with suspected NSTEMI. This will be a cash saving to commissioners and will give capacity benefits to providers. However, if any capacity released because of reduced admissions is immediately filled, these cash benefits will not be realised by commissioners.

2.6 The expected reduction in the number of people admitted is around 70 per 100,000. For an average trust this would result in around 200 people less being admitted per year.

2.7 People will be able to receive the most appropriate treatment in a timely manner.

3 Implications for commissioners and providers

3.1 Cardiological services for patients with NSTEMI are commissioned by clinical commissioning groups. Providers are NHS hospital trusts.

3.2 Although the overall volume of tests is not expected to increase, there may be an increased pressure on labs to turn around the tests quickly. There is expected to be a small cash saving for providers from using highly sensitive troponin tests as the tests cost more than the non-highly sensitive troponin testing.

3.3 It is expected that there will be a reduction in emergency admissions for people with suspected NSTEMI. This is expected to result in a cash saving for commissioners. There will be non-cash releasing bed day savings for providers if they are moving from non-highly sensitive troponin testing to highly sensitive troponin testing. This is due to a reduced length of stay for people with suspected NSTEMI. This saving will be offset by lower income achieved per person. Providers should assess the impact locally.

3.4 Highly sensitive troponin testing falls within the programme budgeting category 10A Coronary Heart Disease.

4 How we estimated the resource impact

The population

4.1 People attending emergency departments have an electrocardiogram (ECG) to rule out ST-elevated myocardial infarction (STEMI).

4.2 People who do not have STEMI are assessed using troponin testing to rule out NSTEMI. The eligible population for highly sensitive troponin testing is people who have an ECG but do not have STEMI. The number of people used in the template is based on 2018/19 hospital episodes statistics (HES) (NHS Digital, 2020).

Table 3 Number of people eligible for treatment per 100,000 population of England

Population	Proportion of previous row (%)	Number of people
Total population		100,000
Accident and emergency (A&E) attendances [1]	44.30	44,304
People having an ECG who are attending A&E with chest pain[1]	3.75	1,661
Number of people who do not have STEMI[2]	96.79	1,608
Total number of people eligible for testing with high-sensitivity troponin tests	100	1,608
Total number of people estimated to have high-sensitive troponin testing each year from 2022/23 once maximum uptake has been reached	100	1,608

[1] Source: 2018/19 Hospital Episode Statistics (HES), NHS Digital 2020

[2] Source: HES, NHS Digital 2018/19 adjusted by MINAP 2013

Assumptions

4.3 The resource impact template assumes that:

- based on the health economic model that supports this guidance, 12% of people having non-high-sensitivity troponin tests will be admitted to hospital for treatment of myocardial infarction.
- based on the health economic model that supports this guidance, 88% of people having non-high-sensitivity troponin testing will be admitted to hospital for testing to rule out NSTEMI.
- based on the health economic model that supports this guidance, people having high-sensitivity troponin tests will test positive for NSTEMI in 12% of cases and be admitted to hospital for treatment of myocardial infarction.
- based on the health economic model that supports this guidance, a further 15% of people having a HS troponin test will have false positive test results (a positive test result from a high sensitivity troponin test that would not have been picked up with a standard troponin test) and be admitted to hospital for a short stay for suspected myocardial infarction.
- based on the health economic model that supports this guidance, 73% of people having high-sensitivity troponin testing will be discharged from hospital.
- based on expert clinical opinion, it is assumed that all people will have 2 troponin tests, this is adjustable in the template.
- for people admitted to hospital for treatment of myocardial infarction, typically between 3 and 5 days, the cost associated with this is estimated to be around £1,800, based on National Tariff 2019/20 and reference cost activity 2017/18
- for people admitted to hospital for a short stay, typically between 36 and 48 hours, for suspected or actual myocardial infarction, following a false positive test, the cost associated with this is

estimated to be around £800, based on National Tariff and reference cost activity.

- for people admitted to hospital with unspecified chest pain, typically between 24 and 36 hours, for assessment with troponin testing the cost associated with this admission is estimated to be around £400, based on National Tariff 2017/18 and reference cost activity 2019/20.
- in future practice, it is assumed that any trusts that previously used non-high-sensitivity troponin tests will move to high-sensitivity troponin tests. These have been apportioned based on the current activity from NEQAS and company feedback.
- the cost of the highly sensitive and standard troponin tests in the template of £2.00 and £2.50 respectively, are based on the costs in the health economic assessment that supports this guidance,

Sensitivity analysis

4.4 Varying the number of people who are admitted to hospital while being tested with non-high-sensitivity troponin tests from 7% to 17% leads to an estimated savings of between £18,000 and £31,000 per 100,000 population of England.

4.5 Varying the number of people having an ECG in the emergency department from 2.75% to 4.75% leads to an estimated savings of between £17,900 and £30,900 per 100,000 population of England.

About this resource impact report

This resource impact report accompanies the NICE guidance on High-sensitivity troponin tests for the early rule out of NSTEMI and should be read with it. See terms and conditions on the NICE website.