

Mark Scheme (Pre-standardisation)

Additional Sample Assessment  
Materials

Pearson BTEC Level 3 National  
Extended Certificate – Applied Human  
Biology

Unit 3: Human Biology and Health  
Issues

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# Unit 3: Human Biology and Health Issues – sample marking grid

## General marking guidance

- All learners must receive the same treatment. Examiners must mark the first learner in exactly the same way as they mark the last.
- Marking grids should be applied positively. Learners must be rewarded for what they have shown they can do rather than be penalised for omissions.
- Examiners should mark according to the marking grid, not according to their perception of where the grade boundaries may lie.
- All marks on the marking grid should be used appropriately.
- All the marks on the marking grid are designed to be awarded. Examiners should always award full marks if deserved. Examiners should also be prepared to award zero marks if a learner's response is not rewardable, according to the marking grid.
- Where judgement is required, a marking grid will provide the principles by which marks will be awarded.
- When examiners are in doubt regarding the application of the marking grid to a learner's response, a senior examiner should be consulted.

## Specific marking guidance

- The marking grids have been designed to assess learner work holistically.
- Rows within the grids identify the assessment focus/outcome being targeted. When using a marking grid, the 'best fit' approach should be used.
- Examiners should first make a holistic judgement on which band most closely matches the learner response and place it within that band. Learners will be placed in the band that best describes their answer.
- The mark awarded within the band will be decided based on the quality of the answer in response to the assessment focus/outcome and will be modified according to how securely all bullet points are displayed at that band.
- Marks will be awarded towards the top or bottom of that band depending on how they have evidenced each of the descriptor bullet points.

**Activity 1: Discuss how the article uses scientific information to present the Hormone Replacement Therapy (HRT) issue.**

**(12 marks)**

**Indicative content**

**Learners:**

- **May include other valid suggestions, not listed below, which should be credited.**
- **May cover a number of examples from the list below.**
- **Would NOT be expected to cover all points to get full marks.**

**Interpretation and analysis**

- a list of the key symptoms of menopause is stated, with minimal data, to support that these are the main symptoms
- article states that HRT is the most effective treatment for menopausal symptoms but not strongly backed up with evidence
- mentions that there are other treatments but does not give any detail of them
- figure 1 is a line graph over 12 weeks, which shows the effect of HRT as a treatment based on just one study and small sample group
- figure 1 is only over 12 weeks, which is a relatively short time compared to the other studies.
- no figures to back up how many women are suffering from the symptoms but not receiving treatment
- figure 2 shows a sharp decrease in numbers after results of initial studies ( 1 and 2) were published
- figure 3 compares the placebo group and the HRT group, showing relative risk for seven conditions.
- figure 3 shows the increased risk of stroke for the HRT group, but decreased risk of hip fractures, breast cancer and heart attacks.
- Large group in deaths without clarifying the cause of death and not much difference between those given oestrogen and those given placebo for that group
- very little difference in bowel cancer incidence between those on oestrogen and those given placebo
- guidelines on prescribing HRT from Public Health England very clear and support study 3.

## Validity and reliability

- 2004 WHI study data was reanalysed suggesting that the original study findings were not valid/questioned. This showed that key information about the participants had affected the conclusions.
- different types of HRT available, such as different dosage (shown in figure 1) but dosage not mentioned in the studies.
- data in Figure 1 show little difference between 100 µg dose and 250 µg but graph scale could be better and would better show the difference
- study 1 ran for five years. Results for women who developed breast cancer only recorded for three years. Results may not be final, may be higher if results were recorded for a longer period of time.
- study 1 based on self reporting from the women taking part – so may not always be accurate (reference to demand characteristics) so therefore may not be valid
- in million women study it compares breast cancer cases for those on HRT with breast cancer deaths in those not on HRT; not comparing like with like – how many not on HRT developed breast cancer and were successfully treated/how many on HRT died of breast cancer?
- not all breast cancers need/are made worse by oestrogen
- better treatments now for breast cancer –
- genetic testing – can now find out which women more susceptible to breast cancer
- study 2 ran for five years, stopped three years early. Results may not be final.
- long-term effects not investigated.
- effectiveness of HRT only investigated for 66 women, which is a small sample size. Only looks at hot flushes rather than other menopause symptoms.
- studies 1, 2 and 3 have a large sample size.
- no ref to age of women in study 2
- study 1 sponsored by BMRC and Cancer Research UK may have a bias when conducting studies.
- the organisations for study 1 may contact/ apply to women affected by cancer and so predisposition to cancer could be higher.
- study 2 carried out in America and may not be representative of women in the UK.
- study 3 contradicts studies 1 and 2, and is a reanalysis of the data from study 2.
- study 3 didn't have contact with the original women and so used secondary data, so reliability could be questioned.

- agreement between study 3 and study 2 on reduction in hip fractures but study 3 contradicted other findings of study 2
- e.g. study 3 found no significant increase in incidence of stroke in treatment group compared to placebo group
- study 3 considered other health factors/extraneous variables such as BMI, age, etc. in its conclusions, which could have distorted the original study conclusions, therefore making study 3 conclusions more valid.
- no reference to statistical analyses of the data – whether differences in study 2 are significant or not/which tests were used/ no range or error bars shown
- references given show material taken from valid sources/peer reviewed
- 12 year gap between study 2 and study 3

<b>Assessment focus</b>	<b>Band 0</b>	<b>Band 1</b>	<b>Band 2</b>	<b>Band 3</b>	<b>Band 4</b>
Interpretation, analysis and evaluation of scientific information.	<b>0</b>	<b>1–3</b>	<b>4–6</b>	<b>7–9</b>	<b>10–12</b>
	Level of response not worthy of credit.	<p>Generalised comments about how the health issue is presented, with limited attempt to consider any of the following:</p> <ul style="list-style-type: none"> <li>• how the article has interpreted and analysed the scientific information to support the conclusions/ judgements being made</li> <li>• the validity and reliability of data.</li> </ul>	<p>The presentation of the health issue is discussed, partially supported by a consideration of some of the following:</p> <ul style="list-style-type: none"> <li>• how the article has interpreted and analysed the scientific information to support the conclusions/ judgements being made</li> <li>• the validity and reliability of data.</li> </ul>	<p>The presentation of the health issue is discussed, mostly supported by a consideration of:</p> <ul style="list-style-type: none"> <li>• how the article has interpreted and analysed the scientific information to support the conclusions/ judgements being made</li> <li>• the validity and reliability of data.</li> </ul>	<p>The presentation of the health issue is discussed, consistently supported throughout by the consideration of:</p> <ul style="list-style-type: none"> <li>• how the article has interpreted and analysed the scientific information to support the conclusions/ judgements being made</li> <li>• the validity and reliability of data.</li> </ul>
		Limited discussion that contains generic assertions rather than considering different aspects.	Displays a partially developed discussion that considers some different aspects.	Displays a developed discussion that considers different aspects.	Displays a well-developed and logical discussion that clearly considers a wide range of different aspects.

## **Activity 2: Discuss the key factors affecting the Hormone Replacement Therapy (HRT) issue. (16 marks)**

### **Learners:**

- **May include other valid suggestions, not listed below, which should be credited.**
- **May cover a number of examples from the list below.**
- **Would NOT be expected to cover all points to get full marks.**

### **Indicative content**

#### **Key factors**

- women suffering symptoms that could be treated by HRT
- not all women who request it are being prescribed HRT treatment
- interfering with the natural course of female ageing and reproductive health
- but most medical treatments interfere with the natural course of ageing/disease
- women from the age of 50 upwards suffer from this reproductive change and will experience a range of symptoms that affects their quality of life
- women can take HRT to relieve their symptoms, such as hot flushes, memory issues etc. to have a better quality of life
- depression and anxiety can have many consequences on general health and well-being/work/family life so alleviating this can be very advantageous
- cost to the NHS – increase in GPs prescribing treatment, cost of treating conditions such as stroke and breast cancer associated with HRT.
- reduction in need to prescribe anti-depressants - saving costs and mitigating potential harmful side-effects of/addiction to anti-depressants
- reduction of hip fractures would save the NHS money
- reference to link between oestrogen and bone rebuilding/reduction in osteoporosis and therefore reduction in hip fractures
- reference to harmful effects of hip fractures
- effect of HRT is different for women who have had a hysterectomy, high BMI etc.
- risk of early death could affect the woman's family



- when prescription of HRT is matched to the woman's circumstances it can prove very effective with minimal risk of adverse side effects

### **Reference to article**

- Reference to statistics from the article
- Uses data from figures
- clear table showing some advantages and disadvantages of different methods of delivering HRT (Fig 4)
  
- summarises guidelines for doctors when deciding whether to prescribe HRT
- Quotes studies
- Uses key terms that are explained in the glossary

<b>Assessment focus</b>	<b>Band 0</b>	<b>Band 1</b>	<b>Band 2</b>	<b>Band 3</b>	<b>Band 4</b>
Understanding the key factors that affect the health issue	<b>0</b>	<b>1–4</b>	<b>5–8</b>	<b>9–12</b>	<b>13–16</b>
	Level of response not worthy of credit.	Demonstrates limited knowledge and understanding of the key factors affecting the health issue with generalised comments made.	Demonstrates adequate knowledge and understanding of the key factors affecting the health issue.	Demonstrates good knowledge and understanding of the key factors affecting the health issue.	Demonstrates comprehensive knowledge and understanding of the key factors affecting the health issue.
		Limited or no reference made to the article.	Attempts to use the article through the selection of some relevant aspects to support answer.	Sustained and logical connections made to the article through the selection of relevant aspects to support answer.	Sustained and comprehensive links made to the article through the selection of a wide range of relevant aspects to support answer.
Limited discussion that contains generic assertions rather than considering different aspects.		Displays a partially developed discussion that considers some different aspects.	Displays a developed discussion that considers different aspects.	Displays a well-developed and logical discussion that clearly considers a wide range of different aspects.	

**Activity 3: Explain how different organisations/individuals influence the Hormone Replacement Therapy (HRT) issue. (10 marks)**

**Learners:**

- **May include other valid suggestions, not listed below, which should be credited.**
- **May cover a number of examples from the list below.**
- **Would NOT be expected to cover all points to get full marks.**

**Indicative content**

Organisation	Influence of scientific issue
NHS	Funding Raising awareness Prescribing HRT Guidelines for doctors
Guardian	Newspaper, general public Gives the number of women per year who are menopausal - raising awareness
New Scientist	Scientific journal, communicates studies Shows the trend in the drop in the prescription of HRT
Menopause matters	Women experiencing symptoms may use menopause matters for information Addresses fear of the possible side effects of HRT
British Medical Research Council (BMRC)	Funding studies Investigated the effect of HRT on breast cancer

Cancer research UK	<p>Funding studies</p> <p>Investigated the effect of HRT on breast cancer</p> <p>May be biased towards the effect of HRT on cancer</p>
Women's Health Initiative (WHI)	<p>Funding studies</p> <p>Carried out study 2</p> <p>Added to the fear of HRT increasing the risk of stroke and blood clots</p>
US National Institutes of Health (NIH)	<p>Funding studies</p> <p>Added to the fear of HRT increasing the risk of stroke and blood clots</p>
New England Journal of Medicine	<p>Scientific journal, communicates studies</p> <p>Reduced the fear of HRT increasing the risk of stroke</p> <p>Highlighted that HRT reduced the risk of hip fractures</p>
Public Health England (PHE)	<p>Guidelines for doctors</p> <p>Emphasising the effective use of HRT with minimal side effects if women are evaluated prior to prescription</p>

Individuals	Influence of scientific issue
Women/patients	Influenced by newspapers and could spread concern over HRT Could reduce number of women entering studies as not willing to take HRT
Lane Lenard PhD	Life extension magazine Confirms effectiveness of HRT for relieving symptoms Has a PhD, qualified academic
Banks. E, Beral V, Reeves G	Million Woman Study Added to the fear of HRT increasing the risk of breast cancer
Susan Ipaktchian	WHI 2004 study Added to the fear of HRT increasing the risk of stroke and blood clots
Harriet Hall	Contradicts and questions validity of 2004 WHI study Reduced the fear of HRT increasing the risk of stroke and blood clots
Nuttan Tanna PhD, MR PharmS	Advice on advantages and disadvantages of taking different types of HRT Highly qualified
Doctors	Opinion on prescribing HRT Responsible for the decline in HRT prescription and being more cautious Allocate NHS funding
Hannah Short	
Chloe Lambert	

<b>Assessment focus</b>	<b>Band 0</b>	<b>Band 1</b>	<b>Band 2</b>	<b>Band 3</b>
Understanding the influence of different organisations/ individuals.	<b>0</b>	<b>1–4</b>	<b>5–7</b>	<b>8–10</b>
	Level of response not worthy of credit.	Demonstrates isolated elements of knowledge of the influence of different organisations/individuals, on research and/or health issue, with major gaps or omissions.	Demonstrates mostly accurate knowledge and understanding of the influence of different organisations/individuals on research and health issues.	Demonstrates accurate and detailed knowledge and understanding of the influence of different organisations/individuals research and health issues.
		A basic explanation of how the organisation/individual may have an influence is given, but with general statements made and limited links to the article.	An explanation of how these organisations/individuals may influence the issue is given, occasionally supported through some linkage and application to the article.	An explanation of how these organisations/ individuals may influence the issue is given, supported throughout with linkage and application to the article.

**Activity 4: Suggest potential areas for further development and/or research of the Hormone Replacement Therapy (HRT) issue.(6 marks)**

**Learners:**

- **May include other valid suggestions, not listed below, which should be credited.**
- **May cover a number of examples from the list below.**
- **Would NOT be expected to cover all points to get full marks.**

**Indicative content**

**Further research needed on:**

- Further research into the mechanisms of menopause
- More studies to cross reference conclusions
- Dosage of HRT/ oestrogen to be effective without side effects
- Long-term effects of HRT, such as over five years or after the menopause
- Subgroups of women investigated HRT vs. placebo but in specific medical groups, such as obese
- Younger women experiencing menopause investigated for the effect of HRT vs. placebo
- How hormone levels link to cancer/ stroke could be investigated
- Alternative treatments to HRT to reduce symptoms without side effects
- Best/most effective way to deliver the treatment
- Factors affecting compliance in patients undergoing treatment
- Awareness of doctors for using guidelines and prescribing HRT
- Cultural effects on symptoms experienced by women – in some cultures very few symptoms as menopause regarded as a welcome release from risk of pregnancy

<b>Assessment focus</b>	<b>Band 0</b>	<b>Band 1</b>	<b>Band 2</b>	<b>Band 3</b>
Application of understanding to identify areas for further development and/or research	<b>0</b>	<b>1-2</b>	<b>3-4</b>	<b>5-6</b>
	Level of response not worthy of credit.	Demonstrates isolated elements of knowledge of the health issue.	Demonstrates mostly accurate knowledge and understanding of the health issue.	Demonstrates accurate and detailed knowledge and understanding of the health issue.
		Limited identification of areas for further development and/or research	A description for further areas of development and/or research is given, occasionally supported through some linkage and application to the article.	A description for further areas of development and/or research is given, supported throughout with linkage and application to the article.



**Activity 5: A recent news headline said:  
'HRT: Horrible Risky Treatment'**

**You have been asked to write an article for a women's health magazine to raise awareness of the safe use of Hormone Replacement Therapy (HRT).**

**When writing your article you must consider:**

- **who is likely to read your article**
- **what you would like the reader to learn from your article.**

**(16 marks)**

**Learners:**

- **May include other valid suggestions, not listed below, which should be credited.**
- **May cover a number of examples from the list below.**
- **Would NOT be expected to cover all points to get full marks.**

**Indicative content**

- Discussion of menopause symptoms
- Talk about how HRT combats menopause symptoms
- Consideration of the benefits
  - reduced hip fractures
  - reduced hot flushes and other negative symptoms
  - improved quality of life
- Explain the risks of HRT – breast cancer, DVT/pulmonary embolism/thrombosis etc. with reference to statistics
- The article should be targeted at the women who read women's health magazines. Clear language; terms need to be explained; not targeted at scientists or doctors but not to patronise
- Consideration of the risk factors:
  - high BMI
  - hysterectomy
  - predisposition to cancer

- bone density (thin women more at risk of osteoporosis)
- other methods of reducing risk of osteoporosis – vitamin D supplements/sensible exposure to sunlight/diet/exercise etc
- pre-existing health conditions
- age when prescribing HRT
- Women should discuss treatment with their doctor and establish their own risks of HRT treatment
- there are alternatives to HRT for some symptoms.
- every woman's experience of the menopause is likely to be different and so the optimum treatment, if required, will also be individual.
- What should be prescribed according to the information in the article on the effectiveness of HRT – 100 µg is almost as effective as 250 µg and likely to give fewer side effects and cost less
- Possible use of other oestrogen agonists that do not have the possible increased risk of breast cancer

<b>Assessment focus</b>	<b>Band 0</b>	<b>Band 1</b>	<b>Band 2</b>	<b>Band 3</b>	<b>Band 4</b>
Synthesises content ideas and demonstrates an understanding of scientific reporting.	<b>0</b>	<b>1–4</b>	<b>5–8</b>	<b>9–12</b>	<b>13–16</b>
	Level of response not worthy of credit.	Identifies some of the key information from the articles.	Summarises the key information and evidence from the articles.	Summarises and attempts to draw together key information using common elements from the articles.	Summarises and consistently draws together key information using common elements from the articles.
		Demonstrates limited understanding of audience or purpose.	Demonstrates some understanding of audience and purpose by some appropriate use of writing style and terminology.	Demonstrates good understanding of audience and purpose by using mostly appropriate writing style and terminology.	Demonstrates comprehensive understanding of audience and purpose by using appropriate writing style and terminology throughout.
	The response will be unstructured and limited to basic points made.	The response shows some structure and coherence.	The response shows a structure that is mostly clear, coherent and logical.	The response shows a well-developed structure that is clear, coherent and logical.	