Question 1.

Define surgical wound healing by secondary intention (SWHSI) and explain why it is clinically and economically significant.

Model Answer:

SWHSI occurs when surgical wounds are left open to heal through granulation tissue formation and epithelialization, rather than primary closure. It is clinically significant because it involves prolonged healing times, frequent complications such as infection, readmission, and reoperation, and a major reduction in patient quality of life. Economically, SWHSI costs health systems between £1500–2400 per month per patient, representing a considerable financial burden.

Question 2.

What is Negative Pressure Wound Therapy (NPWT), and what mechanisms are thought to explain its potential benefits?

Model Answer:

NPWT applies controlled vacuum pressure to a wound via a sealed dressing connected to a pump. It is hypothesized to improve wound healing by:
1. Removing exudate and infectious material,
2. Reducing edema,
3. Increasing perfusion, and
4. Stimulating granulation tissue formation.
These mechanisms theoretically create an environment more favorable for healing.

Question 3.

Briefly describe the design of the SWHSI-2 trial, including population, intervention, control, and primary outcome.

Model Answer:

The SWHSI-2 trial was an open-label, multicentre, parallel-group randomized controlled trial in 29 NHS Trusts in the UK. It enrolled 686 patients ≥16 years with acute SWHSI suitable for either NPWT or usual care. Patients were randomized 1:1 to NPWT (n=349) or

usual care dressings (n=337). The primary outcome was time to complete wound healing, defined as full epithelial cover without scab.

Question 4.

Summarize the main findings of the SWHSI-2 trial regarding time to healing.

Model Answer:

Median time to healing was 187 days in the NPWT group and 195 days in the usual care group, an 8-day difference. The hazard ratio was 1.08 (95% CI 0.88–1.32, p=0.47), indicating no statistically significant benefit of NPWT over usual care. Masked assessment of wound photographs produced similar results (HR 1.13, 95% CI 0.87–1.47).

Question 5.

Discuss the adverse events observed. Were there significant differences between NPWT and usual care?

Model Answer:

Adverse events were common but similar in both groups: 43.0% in NPWT vs 41.2% in usual care. The most frequent events were wound infections, cellulitis, and edema. Fourteen serious adverse events occurred (9 NPWT, 5 usual care), but there were no statistically significant differences in event rates or mortality (11.5% vs 12.8%).

Question 6.

Explain the economic evaluation findings. Was NPWT cost-effective?

Model Answer:

The economic analysis showed mean costs of £5782 (NPWT) and £5802 (usual care), with QALYs of 0.581 and 0.562, respectively. Incremental analysis suggested NPWT slightly increased QALYs (+0.007) but also increased costs (+£251). The probability of cost-effectiveness was <50% at UK NICE thresholds (£20,000–30,000 per QALY). Therefore, NPWT was not cost-effective compared to usual care.

Question 7.

Critically evaluate the implications of the SWHSI-2 trial for clinical practice. Should NPWT be recommended as a first-line therapy?

Model Answer:

The SWHSI-2 trial demonstrated no significant reduction in healing time, no improvement in secondary outcomes, and no evidence of cost-effectiveness. Given the high costs and lack of benefit, NPWT should not be recommended as a first-line therapy for SWHSI, particularly

in lower limb wounds and diabetic patients. Standard dressings remain appropriate. NPWT may have limited roles for exudate management, but not as routine first-line therapy.

Question 8.

Compare the SWHSI-2 trial findings with previous evidence and discuss how this trial advances the field.

Model Answer:

Previous evidence from small RCTs and systematic reviews suggested NPWT might shorten healing times, but those studies were low-quality and at high risk of bias. The SWHSI-2 trial, with a large sample and rigorous design, provides robust evidence that NPWT offers no advantage in healing time, adverse events, or cost-effectiveness. This trial challenges earlier assumptions, prevents the unnecessary use of costly interventions, and sets a new benchmark for evaluating wound therapies. It highlights the need for alternative evidence-based interventions in SWHSI management.