Appendix 2: Massage Intervention

Background of the Intervention: The following massage procedures and protocol were developed by experienced licensed oncology massage therapists in collaboration with Dr. Mao. This protocol is designed to treat musculoskeletal pain and is based on gold-standard textbooks in the field of oncology rehabilitation and medical massage. Versions of this protocol have been piloted in prior research to demonstrate efficacy in pain reduction and adequate safety in the cancer population.

Operating Procedure:
Prior to the treatment session, the massage therapist (MT) will:

- Greet patient/support members, escort them into private room, and sanitize hands.
- Take a focused history on pain and co-morbid symptoms.
- Review relevant medical history, laboratory results and imaging studies to rule out absolute contraindications and to ensure appropriate precautions are taken.
- Conduct a focused physical examination with close attention to medical equipment (e.g. intravenous lines, chemotherapy ports) and areas of swelling/infection/deformities that may affect treatment protocol. Visually assess posture and gait.
- Identify co-morbid complaints of the patient e.g. general aching, psychological distress, fatigue, or poor sleep.
- Assist patient onto table/chair. Establish comfortable body positioning that is appropriate for treatment approach. Offer blanket, pillow, and/or bolster to maximize comfort.
- Adjust patient's clothing per his/her preferences and as indicated for treatment.
- Identify patient's lubricant preference, i.e. oil or lotion.
- Dim lights and offer quiet music.

During the treatment session, the MT will:

- Follow the massage treatment protocol as described below in Table 1 and Table 2.
- Assess joints using active and/or passive pain-free range of motion. Use compression to identify and treat hypertonic muscles, tender/trigger points. Assess for trigger points with referral pattern to the site of pain. Use gentle fascial mobilizations to assess and treat fascial restriction in the area of pain, including surgical scars and tissues with a history of radiation treatment.
- Solicit and respond to patient feedback.

After the treatment session, the MT will:

- Assist patient to get off table/chair.
- Ask patient to re-assess pain and other symptoms, evaluate for adverse events, and invite feedback to be incorporated into future treatment sessions.
- Perform clinical/research documentation.

In subsequent treatment sessions, the MT will:

- Get patient feedback about the impact of the previous session in pain and co-morbid complaints.
- Adjust approach to respond to any shifts in primary area of pain if applicable.

Massage Treatment Protocol (Total Duration: 30 Minutes)

- Set silent timer for 5 minute intervals.
- Perform parasympathetic toning protocol for a minimum of 5 minutes. Assess breathing pattern. Provide verbal and physical cues for diaphragmatic breathing. Perform gentle release of

diaphragm and mobilization of ribs. Compress and muscle strip neck muscles. Perform OA release.

- Identify one focal body area that the patient considers to be the most painful (e.g. neck, shoulder, back, leg).
- Perform fascial release for a minimum of 5 minutes using techniques from the menu. Begin with indirect fascial release for tissues proximal to the site of pain. In subsequent sessions the treatment area may broaden in response to assessment and treatment outcomes.
- Perform tender point release for a minimum of 5 minutes using techniques from the menu. Begin with muscles proximal to the site of pain or with related referral patterns, in subsequent sessions the treatment area may broaden in response to assessment and treatment outcomes.
- Remaining time (2 - 3 minutes) can be used for integrative work distal to the pain site if indicated by gait and postural assessment or patient feedback during the treatment.
- End with effleurage (1-2 minutes) towards the heart, the therapist may use lubricant if necessary and appropriate.

Table 1: Recommended Massage Techniques

▪ Palmar Compression (PC) ▪ Digital Compression (DC) ▪ Lifting/Pincer Compression (LC) ▪ Muscle Stripping (MS) ▪ Active Range of Motion (AROM) ▪ Passive Range of Motion (PROM) ▪ Post-Isometric PROM (PI-PROM) ▪ Post-Isometric AROM (PI-AROM) ▪ Positional Release (PR) ▪ Effleurage (E) ▪ Indirect/Gathering Fascial Release (IFR) ▪ Direct/Stretching Fascial Release (DFR)	▪ Superficial Fascial Release (SFR) ▪ Muscular/Deep Fascial Release (MFR) ▪ Kinetic Fascial Release (KFR) ▪ Long Duration Fascial Release (LDFR) ▪ Short Duration Fascial Release (SDFR) ▪ Compression of trigger/tender point (CTP) ▪ Positional release of trigger/tender point (PRTP) ▪ Local stretch for trigger/tender point (LSTP) ▪ Global/Muscle stretch for trigger/tender point (GSTP)

Table 2: Massage Guide Organized by Primary Location of Musculoskeletal Pain

Primary Pain Location	Recommended Massage Guide
HEAD/JAW **Assess and treat local tissues first then progress to proximal and distal areas. See muscle guides.**	▪ Assess fascial mobility with superficial fascial release of tissues in the focal area with attention to local scars/fibrosis. ▪ Treat restriction with superficial indirect fascial release, tenting tissues over the painful area first. Progress to direct or kinetic fascial release where appropriate. ▪ Compress primary muscles to assess for tension, treat hypertonicity with compression and muscle stripping. ▪ Assess for trigger/tender points keeping in mind common referral patterns and treat with all appropriate elements of integrated TP release protocol. ▪ Assess A/PROM in joints in the area, treat with pain-free joint mobilizations. ▪ Effleurage with strokes directed toward the heart.
CERVICAL SPINE **Assess and treat local tissues first then progress**	▪ Assess fascial mobility with superficial fascial release of tissues in the focal area with attention to local scars/fibrosis.

to proximal and distal areas. See muscle guides.	▪ Treat restriction with superficial indirect fascial release, tenting tissues over the painful area first. Progress to direct or kinetic fascial release where appropriate. ▪ Compress primary muscles to assess for tension, treat hypertonicity with compression and muscle stripping. ▪ Assess for trigger/tender points keeping in mind common referral patterns and treat with all appropriate elements of integrated TP release protocol. ▪ Assess A/PROM in joints in the area, treat with pain-free joint mobilizations. ▪ Effleurage with strokes directed toward the heart.
THORACIC SPINE **Assess and treat local tissues first then progress to proximal and distal areas. See muscle guides.**	▪ Assess fascial mobility with superficial fascial release of tissues in the focal area with attention to local scars/fibrosis. ▪ Treat restriction with superficial indirect fascial release, tenting tissues over the painful area first. Progress to direct or kinetic fascial release where appropriate. ▪ Compress primary muscles to assess for tension, treat hypertonicity with compression and muscle stripping. ▪ Assess for trigger/tender points keeping in mind common referral patterns and treat with all appropriate elements of integrated TP release protocol. ▪ Assess A/PROM in joints in the area, treat with pain-free joint mobilizations. ▪ Effleurage with strokes directed toward the heart.
SHOULDER **Assess and treat local tissues first then progress to proximal and distal areas. See muscle guides.**	▪ Assess fascial mobility with superficial fascial release of tissues in the focal area with attention to local scars/fibrosis. ▪ Treat restriction with superficial indirect fascial release, tenting tissues over the painful area first. Progress to direct or kinetic fascial release where appropriate. ▪ Compress primary muscles to assess for tension, treat hypertonicity with compression and muscle stripping. ▪ Assess for trigger/tender points keeping in mind common referral patterns and treat with all appropriate elements of integrated TP release protocol. ▪ Assess A/PROM in joints in the area, treat with pain-free joint mobilizations. ▪ Effleurage with strokes directed toward the heart.
SHOULDER GIRDLE **Assess and treat local tissues first then progress to proximal and distal areas. See muscle guides.**	▪ Assess fascial mobility with superficial fascial release of tissues in the focal area with attention to local scars/fibrosis. ▪ Treat restriction with superficial indirect fascial release, tenting tissues over the painful area first. Progress to direct or kinetic fascial release where appropriate. ▪ Compress primary muscles to assess for tension, treat hypertonicity with compression and muscle stripping. ▪ Assess for trigger/tender points keeping in mind common referral patterns and treat with all appropriate elements of integrated TP release protocol.

	▪ Assess A/PROM in joints in the area, treat with pain-free joint mobilizations. ▪ Effleurage with strokes directed toward the heart.
CHEST/BREAST **Assess and treat local tissues first then progress to proximal and distal areas. See muscle guides.**	▪ Assess fascial mobility with superficial fascial release of tissues in the focal area with attention to local scars/fibrosis. ▪ Treat restriction with superficial indirect fascial release, tenting tissues over the painful area first. Progress to direct or kinetic fascial release where appropriate. ▪ Compress primary muscles to assess for tension, treat hypertonicity with compression and muscle stripping. ▪ Assess for trigger/tender points keeping in mind common referral patterns and treat with all appropriate elements of integrated TP release protocol. ▪ Assess A/PROM in joints in the area, treat with pain-free joint mobilizations. ▪ Effleurage with strokes directed toward the heart.
RIB CAGE **Assess and treat local tissues first then progress to proximal and distal areas. See muscle guides.**	▪ Assess fascial mobility with superficial fascial release of tissues in the focal area with attention to local scars/fibrosis. ▪ Treat restriction with superficial indirect fascial release, tenting tissues over the painful area first. Progress to direct or kinetic fascial release where appropriate. ▪ Compress primary muscles to assess for tension, treat hypertonicity with compression and muscle stripping. ▪ Assess for trigger/tender points keeping in mind common referral patterns and treat with all appropriate elements of integrated TP release protocol. ▪ Assess A/PROM in joints in the area, treat with pain-free joint mobilizations. ▪ Effleurage with strokes directed toward the heart.
UPPER EXTREMITY **Assess and treat local tissues first then progress to proximal and distal areas. See muscle guides.**	▪ Assess fascial mobility with superficial fascial release of tissues in the focal area with attention to local scars/fibrosis. ▪ Treat restriction with superficial indirect fascial release, tenting tissues over the painful area first. Progress to direct or kinetic fascial release where appropriate. ▪ Compress primary muscles to assess for tension, treat hypertonicity with compression and muscle stripping. ▪ Assess for trigger/tender points keeping in mind common referral patterns and treat with all appropriate elements of integrated TP release protocol. ▪ Assess A/PROM in joints in the area, treat with pain-free joint mobilizations. ▪ Effleurage with strokes directed toward the heart.
ABDOMINAL **Assess and treat local tissues first then progress to proximal and distal areas. See muscle guides.**	▪ Assess fascial mobility with superficial fascial release of tissues in the focal area with attention to local scars/fibrosis. ▪ Treat restriction with superficial indirect fascial release, tenting tissues over the painful area first. Progress to direct or kinetic fascial release where appropriate.

	▪ Compress primary muscles to assess for tension, treat hypertonicity with compression and muscle stripping. ▪ Assess for trigger/tender points keeping in mind common referral patterns and treat with all appropriate elements of integrated TP release protocol. ▪ Assess A/PROM in joints in the area, treat with pain-free joint mobilizations. ▪ Effleurage with strokes directed toward the heart.
LUMBAR **Assess and treat local tissues first then progress to proximal and distal areas. See muscle guides.**	▪ Assess fascial mobility with superficial fascial release of tissues in the focal area with attention to local scars/fibrosis. ▪ Treat restriction with superficial indirect fascial release, tenting tissues over the painful area first. Progress to direct or kinetic fascial release where appropriate. ▪ Compress primary muscles to assess for tension, treat hypertonicity with compression and muscle stripping. ▪ Assess for trigger/tender points keeping in mind common referral patterns and treat with all appropriate elements of integrated TP release protocol. ▪ Assess A/PROM in joints in the area, treat with pain-free joint mobilizations. ▪ Effleurage with strokes directed toward the heart.
SACRAL/PELVIC **Assess and treat local tissues first then progress to proximal and distal areas. See muscle guides.**	▪ Assess fascial mobility with superficial fascial release of tissues in the focal area with attention to local scars/fibrosis. ▪ Treat restriction with superficial indirect fascial release, tenting tissues over the painful area first. Progress to direct or kinetic fascial release where appropriate. ▪ Compress primary muscles to assess for tension, treat hypertonicity with compression and muscle stripping. ▪ Assess for trigger/tender points keeping in mind common referral patterns and treat with all appropriate elements of integrated TP release protocol. ▪ Assess A/PROM in joints in the area, treat with pain-free joint mobilizations. ▪ Effleurage with strokes directed toward the heart.
HIP **Assess and treat local tissues first then progress to proximal and distal areas. See muscle guides.**	▪ Assess fascial mobility with superficial fascial release of tissues in the focal area with attention to local scars/fibrosis. ▪ Treat restriction with superficial indirect fascial release, tenting tissues over the painful area first. Progress to direct or kinetic fascial release where appropriate. ▪ Compress primary muscles to assess for tension, treat hypertonicity with compression and muscle stripping. ▪ Assess for trigger/tender points keeping in mind common referral patterns and treat with all appropriate elements of integrated TP release protocol. ▪ Assess A/PROM in joints in the area, treat with pain-free joint mobilizations. ▪ Effleurage with strokes directed toward the heart.

LOWER EXTREMITY Assess and treat local tissues first then progress to proximal and distal areas. See muscle guides.	▪ Assess fascial mobility with superficial fascial release of tissues in the focal area with attention to local scars/fibrosis. ▪ Treat restriction with superficial indirect fascial release, tenting tissues over the painful area first. Progress to direct or kinetic fascial release where appropriate. ▪ Compress primary muscles to assess for tension, treat hypertonicity with compression and muscle stripping. ▪ Assess for trigger/tender points keeping in mind common referral patterns and treat with all appropriate elements of integrated TP release protocol. ▪ Assess A/PROM in joints in the area, treat with pain-free joint mobilizations. ▪ Effleurage with strokes directed toward the heart.