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***ACL, Meniscus Repair, Osteochondral Transplant Protocol***

	WEIGHT BEARING	BRACE	ROM	EXERCISES	PROGRESSION GOALS
<b>PHASE I - 0-6 weeks</b>	<ul style="list-style-type: none"> <li>• 0-4 Weeks:               <ul style="list-style-type: none"> <li>- TTWB with brace locked and crutches</li> </ul> </li> <li>• 4-6 Weeks:               <ul style="list-style-type: none"> <li>- TTWB with brace locked and crutches</li> <li>- Unlock brace when adequate quad control</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 0-2 Week:               <ul style="list-style-type: none"> <li>- Brace locked 0° extension</li> <li>- Remove for CPM and PT</li> </ul> </li> <li>• 2-4 Weeks:               <ul style="list-style-type: none"> <li>- Unlock brace 0° to 90°</li> </ul> </li> <li>• 4-6 Weeks:               <ul style="list-style-type: none"> <li>- Brace unlocked to full if good quad control and full extension</li> </ul> </li> <li>• 6+ Weeks:               <ul style="list-style-type: none"> <li>- D/C brace for home ambulation</li> <li>- Continue brace for community ambulation until MD approval to D/C</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 0-1 Week:               <ul style="list-style-type: none"> <li>- Full extension and progress flexion to 60°</li> </ul> </li> <li>• 1-4 Weeks:               <ul style="list-style-type: none"> <li>- Maintain full extension and progress to 90°</li> </ul> </li> <li>• 4+ Weeks:               <ul style="list-style-type: none"> <li>- Gradually progress flexion to 120°</li> </ul> </li> </ul> <p><b>STRESS EARLY EXTENSION</b> (avoid hyperextension &gt; 10°)</p>	<ul style="list-style-type: none"> <li>• 0-2 weeks               <ul style="list-style-type: none"> <li>- Quad sets, SLR, calf pumps, passive leg hangs to 90°, gastroc and hamstring stretches</li> </ul> </li> <li>• 2-6 weeks               <ul style="list-style-type: none"> <li>- PROM/AAROM, patella mobs, quad sets, hamstring sets, glut sets, SLR, side-lying, hip and core, heel slides</li> </ul> </li> <li>• 4+ weeks               <ul style="list-style-type: none"> <li>- Static balance</li> <li>- Mini squats</li> <li>- Stationary biking: must be &gt;110° knee flexion</li> </ul> </li> <li>• Other recommended exercises:               <ul style="list-style-type: none"> <li>- Heat (before), Ice (after)</li> <li>- ultrasound</li> <li>- E stim and biofeedback</li> </ul> </li> </ul>	<p><b>Full symmetrical gait without limp or assistance:</b></p> <ul style="list-style-type: none"> <li>• VAS ≤ 5 (worst) &amp; IKDC ≥ 30</li> <li>• Knee extension PROM ≥ 0°</li> <li>• Knee Flexion PROM ≥ 90°</li> <li>• ≥ 30 SLR without quad lag</li> <li>• BESS (SL-FIRM) ≤ 5</li> <li>• MD or PT APPROVAL</li> </ul>
<b>PHASE II – 6-8 weeks</b>	<ul style="list-style-type: none"> <li>• Advance 25% every 3-5 days until FWB at 8 weeks</li> </ul>	<ul style="list-style-type: none"> <li>• Discontinued at 6 weeks if no extension lag</li> </ul>	<ul style="list-style-type: none"> <li>• 6+ Weeks:               <ul style="list-style-type: none"> <li>- Maintain full extension</li> <li>- Progress to full flexion</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Continue with Phase I</li> <li>• Add stationary bike</li> <li>• Gait training</li> </ul>	

- Monitor for pain and swelling. Modify as necessary.
- Encourage home exercises program daily
- Encourage ice 4x a day for 20 minutes while swelling is present
- For any questions or concerns please contact Dr. Tauberg's

## ACL, Meniscus, Osteochondral Transplant Protocol

	WEIGHT BEARING	BRACE	ROM	EXERCISES	PROGRESSION GOALS
<b>PHASE III - 8-16 weeks</b>	<ul style="list-style-type: none"> <li>As tolerated</li> </ul>	<ul style="list-style-type: none"> <li>Functional bracing dependent on patient activity and doctor recs</li> </ul>	<ul style="list-style-type: none"> <li>Full, painless</li> <li>12+ Weeks:               <ul style="list-style-type: none"> <li>Maintain symmetry &amp; pain-free with overpressure</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Advance Phase II</li> <li>Gait training</li> <li>Begin closed-chain activities:               <ul style="list-style-type: none"> <li>Wall sits, shuttle, mini-squats, toe raises</li> <li>Loaded flexion &gt;90° is PROHIBITED</li> </ul> </li> <li>Begin unilateral stance activities</li> <li>Balance training</li> <li>Strengthening               <ul style="list-style-type: none"> <li>Leg press, step ups, step downs, RDLs, lunges, Bulgarian squats, wall sits</li> <li>Squat progression: bodyweight → single leg</li> <li>Advance hip abduction &amp; glute strength: band walks, lateral lunge, reverse lunge, bridges, hip thrusters</li> <li>Core exercises: planks, side planks, v-ups, Russian twist, superman</li> <li>Balance training: foam pad, balance board, BOSU</li> </ul> </li> <li>Conditioning               <ul style="list-style-type: none"> <li>Stationary bike: encourage daily biking, may begin interval training if non-reactive</li> <li>Swimming: progress kicking gradually and pain-free, no flip turns</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>NO impact activities until 8 months post-op</li> <li>Criteria for Phase III               <ul style="list-style-type: none"> <li>Pain less than 3/10 (worst)</li> <li>Within 2° normal knee extension and 120° knee flexion</li> <li>Symmetrical body-weight squat</li> <li>Minimal effusion/pain</li> <li>Symmetrical gait without limp</li> </ul> </li> </ul>
<b>PHASE IV – 16-24 weeks</b>	<ul style="list-style-type: none"> <li>Full</li> </ul>	<ul style="list-style-type: none"> <li>Functional bracing dependent on patient activity and doctor recommendation</li> </ul>	<ul style="list-style-type: none"> <li>16+ Weeks:               <ul style="list-style-type: none"> <li>Maintain symmetry &amp; pain-free with overpressure</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Strengthening               <ul style="list-style-type: none"> <li>Gym strengthening: squats, deadlifts, initiate Olympic lifting</li> <li>SL strengthening: SL quats, sit to stands, ball slams, step ups/downs</li> <li>Dynamic Core exercises: planks, pikes, pale off press, mountain climbers</li> <li>Integrate interval strength circuits &amp; work/rest timed intervals</li> </ul> </li> <li>Conditioning               <ul style="list-style-type: none"> <li>Initiate Dynamic warmup: Frankenstein kicks, leg swings, knee hugs, heel sweeps, heel-toe walks, oil rigs, lateral lunge hip rotation, inch worm, speed squats</li> </ul> </li> </ul>	-

# ACL, Meniscus, Osteochondral Transplant Protocol

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				<ul style="list-style-type: none"> <li>- Stationary bike, elliptical, swimming, &amp; rowing machine</li> <li>- 16+ Weeks: Alter-G treadmill walk/jog progressions. Begin with 30"-1' W/J intervals, advance jog time as tolerated, no more than by 1 min each week</li> </ul>	
<b>PHASE V – 24-32 weeks</b>	<ul style="list-style-type: none"> <li>• Full</li> </ul>	<ul style="list-style-type: none"> <li>• Functional bracing dependent on patient activity and doctor recommendation</li> </ul>	<ul style="list-style-type: none"> <li>• Promote and maintain symmetry</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthening               <ul style="list-style-type: none"> <li>- Continue Phase IV</li> </ul> </li> <li>• Conditioning               <ul style="list-style-type: none"> <li>- Dynamic warmup</li> <li>- Stationary bike, elliptical, swimming, &amp; rowing machine</li> <li>- 24+ Weeks: treadmill walk/jog progressions. Begin with 30"-1' W/J intervals, advance jog time by 1 min each week</li> <li>- 24+ Weeks: Double leg jump rope and shuttle jumps</li> </ul> </li> </ul>	<b>Criteria For Jogging &amp; Double Leg Jump Rope</b> <ul style="list-style-type: none"> <li>• VAS <math>\leq 3</math> (worst) &amp; IKDC <math>\geq 60</math></li> <li>• Within 2° normal knee extension &amp; 120° knee flexion</li> <li>• Heel height difference <math>\leq 1</math>cm</li> <li>• Quad and hamstring strength <math>\geq 60\%</math> normal</li> <li>• Overhead squat (FMS) <math>\geq 2</math></li> <li>• Less than 4cm deficit on single-leg squat (anterior reach)</li> <li>• Single leg squats (Vail Test) <math>\geq 1</math> minute</li> <li>• MD approval</li> </ul> <p>- If meet "goal progression" criteria, begin straight line jog to run progression at <b>16 weeks</b> for allograft</p>
<b>PHASE VI 32-36 weeks</b>	<ul style="list-style-type: none"> <li>• Full</li> </ul>	<ul style="list-style-type: none"> <li>• Functional bracing dependent on patient activity and doctor recommendation</li> </ul>	<ul style="list-style-type: none"> <li>• Promote and maintain symmetry</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthening               <ul style="list-style-type: none"> <li>- Continue phase V</li> <li>- Dynamic eccentric loading: double &amp; single leg</li> <li>- Dynamic core: rotational and anti-rotational drills</li> <li>- Isokinetic training protocols: being with 300°/sec, progress to 180°/sec</li> </ul> </li> <li>• Conditioning               <ul style="list-style-type: none"> <li>- Dynamic warmup</li> <li>- Biking, jogging, swimming, &amp; rowing</li> </ul> </li> </ul>	<b>Criteria for Plyometrics &amp; Agility:</b> <ul style="list-style-type: none"> <li>• VAS <math>\leq 2</math> (Worst) &amp; IKDC <math>\geq 70</math></li> <li>• Tampa Kinesiophobia Scale <math>&lt; 20</math></li> <li>• Heel Height Difference <math>\leq 1</math> cm</li> <li>• Quad &amp; HS symmetry <math>\geq 80\%</math> normal; <math>\geq 50\%</math> H/Q ratio for females</li> <li>• Y Balance deficits <math>&lt; 4</math> cm (each direction)</li> <li>• Landing error scoring system <math>\leq 5</math></li> <li>• At least 3 minutes of single-leg</li> </ul>

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				<ul style="list-style-type: none"> <li>- Advance to track workouts: jog straights and walk curves</li> <li>• <b>Plyometrics &amp; Agility</b></li> <li>- Ladder drills, footwork agility drills</li> <li>- Double leg plyos: shuttle jumps, jump rope, line jumps, depth jumps, box jumps</li> <li>- Single leg plyos: alternating SL, SL hops, SL bounding</li> </ul>	squats (resisted) <ul style="list-style-type: none"> <li>• Jogging &gt;15 minutes on treadmill</li> <li>• MD or PT APPROVAL</li> <li>• Allografts delay plyometrics to <b>24 weeks</b></li> </ul>
<b>PHASE VII – 36-40 weeks</b>	<ul style="list-style-type: none"> <li>• Full</li> </ul>	<ul style="list-style-type: none"> <li>• Functional bracing dependent on patient activity and doctor recommendation</li> </ul>	<ul style="list-style-type: none"> <li>• Full</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Strengthening</b></li> <li>- Continue Phase VI</li> <li>- Interval strength circuits &amp; work/rest timed intervals</li> <li>- Isokinetic protocols: 300°, 180°, and 60°/sec</li> <li>- Complex movement patterns</li> <li>• <b>Conditioning</b></li> <li>- Biking, jogging, swimming, &amp; rowing</li> <li>- Track workouts: advance to linear speed and sprinting drills</li> <li>• <b>Plyometrics &amp; Agility (Double and Single Leg)</b></li> <li>- Tuck jumps, squat jumps, bounding, SL hop, SL triple hop, SL cross over hop</li> <li>- Cone drills and change of direction drills: begin with &lt;90°, progress to 90° and greater</li> <li>- High intensity predictable patterned movements</li> </ul>	<b>Criteria for Advanced Agility &amp; SL Plyometrics:</b> <ul style="list-style-type: none"> <li>• VAS ≤ 2 ( Worst) &amp; IKDC ≥ 80</li> <li>• Quad &amp; Hamstring strength ≥ 80% normal; ≥ 50% H/Q ratio for females</li> <li>• At least 3 minutes of single leg squats (resisted)</li> <li>• Jogging &gt;15 minutes on track or paved surface</li> <li>• MD APPROVAL</li> <li>•</li> </ul>
<b>PHASE VIII 40+ Weeks</b>	<ul style="list-style-type: none"> <li>• Full</li> </ul>	<ul style="list-style-type: none"> <li>• Functional bracing dependent on patient activity and doctor recommendation</li> </ul>	<ul style="list-style-type: none"> <li>• Full</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Strengthening</b></li> <li>- Continue Previousl phases</li> <li>• <b>Conditioning</b></li> <li>- Biking, jogging, swimming, &amp; rowing</li> <li>- Interval sprint workouts</li> <li>• <b>Plyometrics &amp; Agility (2-3 days/week)</b></li> <li>- Max effort DL and SL jumps → progress with rotation</li> <li>- Lateral &amp; rotational agility drills</li> </ul>	<b>Return to Play Criteria:</b> <ul style="list-style-type: none"> <li>• VAS ≤ 2 ( Worst) &amp; IKDC ≥ 80</li> <li>• &gt;75/100 on ACL-RSI survey</li> <li>• Quad &amp; Hamstring strength ≥ 90% normal; ≥ 60% H/Q ratio for females</li> <li>• 90% normal on single-leg hop tests</li> <li>• 95% normal figure of 8, 5-10-5 pro-agility, &amp; SL vertical jump</li> <li>• Complete sports metrics</li> </ul>

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				<ul style="list-style-type: none"> <li>- Unpredictable cutting agility</li> <li>- Non-contact drills → contact drills with MD approval</li> <li>• Return to practice → contact practice → scrimmage → interval play → full play</li> </ul>	<ul style="list-style-type: none"> <li>• MD APPROVAL</li> </ul>

- Do NOT change bandages unless instructed by physician
- Monitor for pain and swelling. Modify as necessary.
- Encourage home exercises program daily
- Encourage ice 4x a day for 20 minutes while swelling is present.
- If hamstring graft, no hamstring stretching x 4 weeks, no hamstring strengthening x 6 weeks
- For any questions or concerns please contact Dr. Tauberg's office